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# Worldwide Report

TELECOMMUNICATIONS POLICY,  
RESEARCH AND DEVELOPMENT

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9 October 1984

# WORLDWIDE REPORT

## TELECOMMUNICATIONS POLICY, RESEARCH AND DEVELOPMENT

### CONTENTS

#### ASIA

##### PEOPLE'S REPUBLIC OF CHINA

Development of Radio, Television Reviewed (XINHUA, 13 Sep 84).....	1
XINHUA Lauds Young Satellite Workers (Peng Ziqiang, Liu Jianghai; XINHUA Domestic Service, 17 Sep 84).....	2
Expert on PRC's Carrier Rocket, Satellite Advances (ZHONGGUO XINWEN SHE, 20 Sep 84).....	3
Yin Fatang Visits Xizang Satellite Ground Station (Xizang Regional Service, 20 Sep 84).....	4

##### THAILAND

Samak Discusses Satellite Possibilities (DAILY NEWS, 27 Feb 84).....	6
Radio Intercept, Direction Finding Capability Noted (MATUPHUM, 15 May 84).....	7
Samak: Thailand May Get Satellite in 2 Years (DAILY NEWS, 18 May 84).....	8

#### CANADA

Record Sales at Northern Telecom for 1984 Second Quarter (Paul Durivage; LE DEVOIR, 25 Jul 84).....	9
--	---

Mitel Telephone Switch Agreement With PRC Reported (Lawrence Surtees; THE GLOBE AND MAIL, 23 Aug 84).....	11
--	----

Briefs	
Mitel-Wang Agreement	12

## EAST EUROPE

### HUNGARY

Status Survey of Optical Communications (Tibor Bercei, et al.; HIRADASTECHNIKA, No 3, 1984).....	13
Supervisory, Remote Control Equipment for Telecommunications Networks (Istvan Kerecsen, et al.; HIRADASTECHNIKA, No 3, 1984)....	16

## LATIN AMERICA

### INTER-AMERICAN AFFAIRS

Andean Pact Countries Plan Joint Satellite (Fabiola Beltran; EL TIEMPO, 13 Sep 84).....	17
--	----

### BOLIVIA

Cliza Province To Receive Automatic Telephone Exchange (EL DIARIO, 29 Aug 84).....	20
ENTEL Expansion Project To Benefit Mining, Farming Regions (EL DIARIO, 15 Aug 84).....	22

## NEAR EAST/SOUTH ASIA

### INDIA

Briefs	
TV Transmitters Commissioned	24
Shortwave Transmitters at Aligarh	24
Bichannel TV Programs	24
PTI-XINHUA Satellite Linkup	25

## SUDAN

- Official Describes Telecommunications Situation  
( 'Abdallah Muhammad Yasin Interview; AL-SAHAFAH, 11 Aug 84) . 26

## SUB-SAHARAN AFRICA

### INTER-AFRICAN AFFAIRS

- Status of Telecommunications Networks Reviewed  
(TELECOMUNICAZIONI, May-Jun 84)..... 33
- Forecasts to 1990, by Marisa Spelta  
ITALCOM Projects in Mozambique

### SOUTH AFRICA

- Broadcasting Chief of Funding  
(Johannesburg Domestic Service, 19 Sep 84)..... 50

## WEST EUROPE

### BELGIUM

- Hundred Billion Francs To Be Invested in Phone Equipment  
(LA LIBRE BELGIQUE, 7 Aug 84)..... 51

### FRANCE

- Sweden Joins France in 'SPOT' Satellite Project  
(AFP SCIENCES, 24 May 84)..... 53
- Hirel Named to Cabinet Position To Aid PTT Minister  
(LE MONDE, 7 Aug 84)..... 55
- Strategy for Answering Machines Sales Unsuccessful  
(LES ECHOS, 8 Aug 84)..... 57

### LUXEMBOURG

- Expansion of Telecommunications Services Planned  
(LUXEMBURGER WORT, 25 Jul 84)..... 60

### NORWAY

- Study Group Proposes Splitting Telecommunications Agency  
(Ulf Peter Hellstrom; AFTENPOSTEN, 29 Aug 84)..... 64

PEOPLE'S REPUBLIC OF CHINA

DEVELOPMENT OF RADIO, TELEVISION REVIEWED

OW130745 Beijing XINHUA in English 0632 GMT 13 Sep 84

["Developing Radio and Television in China--Twenty-eighth of the National Day Focus Series"--XINHUA headline]

[Text] Beijing, 13 September (XINHUA)--Nearly two-thirds of China's one billion people listen to the radio or watch television, according to the Ministry of Radio and Television here.

Radio programs are now available to 64.5 percent of the population, while TV reaches 59.9 percent, ministry officials said.

By the end of 1983, there were 122 radio stations operating on 184 frequencies. Together they offered an average 2,165 hours of programming a day.

The central People's Broadcasting Station maintains six frequencies including one for ethnic minorities and two which are beamed to Taiwan.

Local cable radio networks have also been established in 2,619 rural counties, reaching 76 percent of their production brigades and 62 percent of their production teams.

Chinese shortwave stations broadcast 138 hours of programs daily in 38 foreign languages, up from only 11 hours a day in 1950. The stations receive about 100,000 letters a year from listeners in more than 140 countries.

Television viewing has increased steadily since its introduction to China in 1958. By the end of last year, 52 stations and 7,475 relays had been established, allowing all Chinese provinces, municipalities and autonomous regions except Tibet and Xinjiang to receive the national Central Television Station.

Chinese shoppers had bought 214,650,000 radios and 36 million television sets by the end of last year.

CSO: 5500/4162

PEOPLE'S REPUBLIC OF CHINA

XINHUA LAUDS YOUNG SATELLITE WORKERS

OW221259 Beijing XINHUA Domestic Service in Chinese 1649 GMT 17 Sep 84

[Newsletter by XINHUA reporter Peng Ziqiang and XINHUA correspondent Liu Jianghai:  
"Young People in the Satellite Launching Center"--XINHUA headline]

[Excerpts] Beijing, 17 Sep (XINHUA) -- On 12 September, China again launched a scientific experiment satellite. On 17 September, the satellite was recovered as scheduled. Everyone was elated at the successful satellite launching and spoke highly of the young college graduates participating in it. With high aspirations, courage, and insight, these young college graduates, working hard at their specific satellite launching posts, are making contributions to China's space endeavors.

Participating in satellite launching for his first time, Zhu Youjiu, a 22-year-old college graduate, skillfully operated the push-button controls on the control panel. In less than a minute, he rapidly and accurately completed over 100 operations till the last operation just before the satellite was in flight. Meanwhile, Guo Huizheng, a young girl from Beijing, was busily working at the data processing center in the launch and control station. While the software she wrote was running through the computer, she fixed her eyes on the changing data spewed out from the printer on a wide-column tape. Her heart was filled with great joy. Shen Che, a 26-year-old 1982 college graduate who was just appointed deputy chief of a branch control section of the satellite launch directing and control center, solemnly received several sets of secret codes indispensable for the satellite launch. After activating a specially designed key and feeding the secret codes into the control receiver, he made the circuit connection and, like a veteran Army general, fixed his gaze on several dozen blinking signals. When the milky white rocket carrying the satellite sped across the blue sky, leaving a long trail of white smoke behind, its path appeared on the screen like a fairy flying in her long white silk robe. Thus, a satellite was successfully launched.

CSO: 5500/4160

PEOPLE'S REPUBLIC OF CHINA

EXPERT ON PRC'S CARRIER ROCKET, SATELLITE ADVANCES

HK201452 Beijing ZHONGGUO XINWEN SHE in Chinese 0924 GMT 20 Sep 84

[Report: "Expert Ren Xinmin Speaks on China's Astronautics Industry"]

[Text] Beijing, 20 Sep (ZHONGGUO XINWEN SHE) -- China is now in a position to launch satellites for other countries, thereby serving the world and benefiting mankind.

He said: Through photographs of our territory taken by our satellites, China has obtained a vast amount of information regarding land surveys, geological surveys, the exploitation of water power, the use of water resources, water and soil conservation, railways, navigation channels, port construction, environmental protection, agriculture and forestry, petroleum, the ocean, earthquake forecasts, and archaeology.

Ren Xinmin said: China's space industry is confronting an arduous and difficult task of catering to economic construction and the world. We are urgently required to research, manufacture, and launch a series of land survey, resources, landmapping, meteorological, communications, and broadcasting satellites. This calls on us to continuously improve and upgrade the quality and reliability of our carrier rockets to guarantee and upgrade the service life of satellites so the satellites are truly durable and reliable. He predicted a new situation will certainly be created in China's space industry in fulfilling the important task of catering to economic construction and the world.

CSO: 5500/4159



PEOPLE'S REPUBLIC OF CHINA

YIN FATANG VISITS XIZANG SATELLITE GROUND STATION

HK210419 Lhasa Xizang Regional Service in Mandarin 1130 GMT 20 Sep 84

[Text] At 1900 on 18 September, Lhasa's ground satellite station received channel one TV programs relayed by CCTV through China's experimental communications satellite. The picture was clear, the color bright, and the sound was loud enough. The facilities and equipment of the entire station worked properly. The test was completely successful.

At 1930 on 19 September, regional party, government and Army leading comrades, and regional CPPCC responsible comrades arrived at Lhasa's ground satellite station to watch with interest the test program, and warmly congratulated the success. Yin Fatang, first secretary of the regional CPC Committee, wrote an inscription: "The successful reception of TV programs will enable us to hear melodious sounds and watch beautiful pictures everywhere. I express my gratitude to the units and comrades concerned for their efforts in contributing to the new Xizang."

Lhasa's communications satellite ground station is one of the key projects selected by the CPC Committee and State Council to aid Xizang. As early as 1975, the project had already been approved by Chairman Mao and Premier Zhou. In October of last year, the central departments concerned assigned the task of establishing the station's antenna tracing system to Nanjing's Electronics Technology Research Institute. Through strenuous efforts exerted over the past 10 months, this project was completed 2 months or so ahead of schedule. This was the second project establish a large-scale antenna tracing system for the communications satellite ground station completed in China. Thanks to the great support provided by Air Force units, all the equipment and facilities, weighing nearly 40 tons, were airlifted and arrived in Lhasa on 1 September.

In the process of installing this equipment and facilities, scientific and technical cadres and workers from Nanjing and Guizhou, helping Xizang, strictly observed instructions issued by Premier Zhou during his lifetime: "Combine strictness with caution, do things exhaustively and carefully, and work out safe and reliable plans in order to ensure that nothing goes wrong." They overcame difficulties caused by high barometric pressure, and worked extra shifts and hours day and night in order to carry out the operations consecutively. They completed the work of installing this equipment and facilities within a very short period of time.

The success of the project of Lhasa's communications satellite will enable the people of various nationalities of Lhasa to watch the direct television relay of the 35th National Day celebration held in Beijing on 1 October. With the completion of this project, people of various nationalities will be able to watch television programs directly provided by CCTV. In this way, people in Xizang will be closer to the CPC Central Committee, and usually know more about timely, important events happening both at home and abroad. This will play a role in promoting the acceleration of economic and cultural development in Xizang.

CSO: 5500/4160

THAILAND

SAMAK DISCUSSES SATELLITE POSSIBILITIES

Bangkok DAILY NEWS in Thai 27 Feb 84 p 20

[Article: "Thailand will Have Its Own Satellite"]

[Text] Mr Samak Sunthonwet, the minister of communications, said that at present, the Ministry of Communications is urgently studying the matter of whether Thailand should have its own satellite. Concerning this matter, the cabinet has already given its approval in principle. The reason why the Ministry of Communications is studying this matter is that several countries in Asia, including India and Indonesia, have their own satellites, and these countries have benefited greatly from satellite communications. If Thailand had its own satellite, it would be able to make full use of satellite communications and expand things greatly. The study of the data should be completed very soon. The Ministry of Communications will then submit the data to the cabinet so that it can make a decision on whether Thailand should have its own satellite.

Mr Samak also said that concerning the telex, or teletype, system, the policy of the Ministry of Communications is to increase the number of teleprinters in order to keep up with demand. At present, there are about 5,000 teleprinters in use. Another 5,000 teleprinters will be put into use. As for underwater cable communications, Thailand has some underwater cable communications with foreign countries, particularly ASEAN countries such as Malaysia and Singapore. At present, negotiations are underway for laying an underwater cable to the Philippines.

11943

CSO: 5500/4398

THAILAND

RADIO INTERCEPT, DIRECTION FINDING CAPABILITY NOTED

Bangkok MATUPHUM in Thai 15 May 84 p 2

[Article: "Radio Intercept Station Built In Nakhon Sithammarat"]

[Text] The Postal Department is spending 10 million baht to build a new radio intercept station in Nakhon Sithammarat Province. It will look for unauthorized frequencies. It was revealed that about 50 illegal stations that intercept government radio reports are seized each year.

Mr Mahidon Chantharangkun, the director-general of the Post and Telegraph Department, talked with MATUPHUM about the construction of a radio intercept station. He said that at present, the Post and Telegraph Department is building its eighth radio intercept station. This one is in Nakhon Sithammarat Province. It will cost 10 million baht. It is being built on approximately 10 rai of land in Thangiu Subdistrict in Muang District. Construction bids will be tendered in July. The ninth station will be built in Phuket Province in 1985.

Mr Mahidon said that intercept stations are being built at the rate of only one per year since funds are limited. These intercept stations can be used to look for unauthorized frequencies. Most of these come from stations that are operating illegally. Besides this, these intercept stations can also check to see if anyone is intercepting government radio reports. During the past several years, there have been 40-50 such arrests a year. In making such arrests, there is an intercept section that checks for unauthorized frequencies. Another section, composed of four to five inspectors, conducts investigations and makes arrests if it finds that radios are being used illegally. Four direction-finding vans, which cost 5 million baht each, park at different points in order to determine the location of the illegal station. If they are sure about this, an arrest is made.

As for not being able to expand the program in accord with the targets, this stems from the fact that funds for building stations and purchasing equipment is limited. Also, the number of officials cannot be increased in accord with the needs since the government's policy is to keep the expansion of the bureaucracy below 2 percent a year. The result has been that this work has not made the progress it should have. However, if 20 radio intercept stations can be built nationwide, it will be possible to carry on this work more efficiently.

THAILAND

SAMAK: THAILAND MAY GET SATELLITE IN 2 YEARS

Bangkok DAILY NEWS in Thai 18 May 84 p 3

[Article: "Thailand Will Have Its Own Satellite; Samak Has Named It 'Rama Saet'"]

[Text] Samak is again "dreaming" about Thailand having its own satellite. The U.S. National Aeronautics and Space Administration has been approached. If the cabinet gives the green light, it is hoped that this will be ready for use within 2 years.

This was revealed by Mr Samak Sunthonwet, the minister of communications, at a debate on the topic "Development of the Communications System during the Next 10 Years" that was held at the main office of Bangkok Bank. He said that the Ministry of Communications has contacted a private U.S. company in order to have it study the feasibility of Thailand having its own communications satellite.

Mr Samak said that this private U.S. company has offered to pay for the study itself, which will cost approximately 40 million baht.

The minister of communications, who has gained the image of someone who likes to think up projects almost daily, also said that if a communications satellite can be built, it will be modeled on that now being used by Indonesia, that is, the Palapa satellite. It will take about 33 months to construct. If the cabinet gives its approval, we will have a satellite in use by [the end of] 1986. As for investments, this should be a joint public-private venture, with the government and the private sector each contributing 49 percent. The Assets Office can contribute the other 2 percent.

As for the name of this satellite, he has already given it the name "Rama Saet."

11943

CSO: 5500/4398

RECORD SALES AT NORTHERN TELECOM FOR 1984 SECOND QUARTER

Montreal LE DEVOIR in French 25 Jul 84 p 13

[Article by Paul Durivage: "Northern Telecom Sales Exceeded \$1 Billion in the Second Quarter"]

[Text] Northern Telecom set a new record for sales and profits in the second quarter of 1984 and exceeded its growth objectives.

The turnover of the Enterprises Bell Canada subsidiary was \$1.05 billion or an increase of 28.4 percent over the same period last year. Sales registered particularly strong increases in the United States, where they increased nearly 45 percent. They now account for 62 percent of the total turnover as opposed to 55 percent in the second quarter of 1983.

The net profit reached \$78.7 million or 67 cents per share of common stock for an increase of 26.1 percent over the previous year. Gross profits remained at high levels despite depressed profits on the line of private automatic telephone switching.

"These results are in line with our predictions. Our performance has enabled us to meet the goals we had set, namely growth of more than 25 percent in turnover for the fiscal year, slightly more rapid growth in before-tax profits, and a rate of per-share profit growth similar to the turnover growth rate," said Mr Walter Light, chairman of the board of directors and head of management. The Mississauga company's objectives are high even though turnover and profits have shown an average growth of "only" 15 and 18.9 percent respectively in the last 5 years.

Mr Light was particularly satisfied with the level of new orders. This is the first time that orders on Northern's books have exceeded \$2 billion at midyear. The Canadian telephone manufacturer benefits from strong demand from the Bell telephone companies and from other companies with networks in the United States.

The second-quarter results also agree with projections made by financial analysts. Mr Thomas Law of Nesbitt, Thomson, Bongard confirms his forecasts of per-share profits of \$2.70 for the current fiscal year and \$3.40 for 1985.

When questioned by LE DEVOIR, the analyst emphasized the great increase in demand for the DMS digital automatic public telephone switching devices, which are NorTel's most profitable product. Sales of these telephone systems increased 41.2 percent in the period under comparison and is said to account for 34.4 percent of the turnover in the second quarter of 1984. Mr Law thinks this trend will continue.

Northern has also increased its expenses for research and development to \$110.4 million or 10.5 percent of the turnover in the second quarter as opposed to \$81.1 million or 9.9 percent of the turnover for the same period in 1983. NorTel expects to spend about 10 percent of the fiscal year's turnover on research, which is about the same as the industry average.

Northern Telecom is the second largest developer and manufacturer of telecommunications hardware in North America and the sixth largest in the world. It has research centers and 46 factories in Canada, the United States, the United Kingdom, the Republic of Ireland, Malaysia and Brazil.

8782

CSO: 5500/2772

## MITEL TELEPHONE SWITCH AGREEMENT WITH PRC REPORTED

Toronto THE GLOBE AND MAIL in English 23 Aug 84 p B1

[Article by Lawrence Surtees: "Mitel Makes Sales Breakthrough With China"]

## [Text]

Mitel Corp. of Kanata, Ont., has cracked the Chinese market with the announcement yesterday of an agreement for the manufacture of Mitel small telephone switches in Chinese factories.

Under the \$1.8-million (U.S.) agreement with the Ministry of Chinese Electronics Industry that runs until March, 1985, Mitel will provide technical and marketing support and supply subassemblies for the production of its SX-200 private branch exchange telephone system.

The ministry's computer industry branch will produce the switch at the Ai Hua Electronics Co. in Shenzhen and Peking Wire Communication Co. in Peking.

Mitel is training some of the Chinese workers in the company's Hong Kong office and will send staff to the Chinese plants. The subassemblies will be exported to China and other components manufactured there. The SX-200 switches produced will be

sold only in the Chinese domestic market.

Bernie Watts, vice-president and general manager of Mitel Asia Pacific Region, said: "Mitel sees this venture as the beginning of a long and successful relationship for both parties."

The arrangement marks Mitel's first sale to China. The agreement also requires minimal expenditure for new assembly plants, an important factor as Mitel seeks to cut costs to return to profitability.

In its drive to modernize its economic infrastructure, China has given a high profile to developing its telecommunications system and gaining manufacturing expertise. Telecommunications is one of nine fields that Premier Zhao Ziyang has singled out for increased Canadian imports.

The potential market in China for telecommunication products is enormous, given a population of more than one billion people and

the fact there are only three telephones for every 1,000 people, compared with 700 for every 1,000 in North America.

Government officials in Ottawa forecast earlier this year that high-technology manufacturers could gain as much as \$100-million in new business this year with China, a tenfold increase in exports of Canadian goods. Last year, manufactured goods accounted for less than 1 per cent of Canada's exports to China of \$1.02-billion.

The SX-200, which can switch up to 200 telephone lines, will be used in Chinese office buildings.

Although further discussions are not taking place, Mitel spokesman Diana Daghofer said there is a possibility that similar arrangements could be made to manufacture other Mitel products in China. These products include specialized telephone sets, the smaller SX-100 and larger SX-400 PBXs.



BRIEFS

MITEL-WANG AGREEMENT--Mitel Corp. of Kanata, Ont., and Wang Laboratories Inc. of Lowell, Mass., have agreed to work out technical arrangements that will allow the connection of Wang computers, over standard telephone wires, through Mitel's switching equipment. Mitel said it plans similar agreements with other computer makers. [Text] [Toronto THE GLOBE AND MAIL in English 24 Aug 84 p B11]

CSO: 5520/10

## STATUS SURVEY OF OPTICAL COMMUNICATIONS

Budapest HIRADASTECHNIKA in Hungarian No 3, 1984 pp 97-104

[Article by Dr Tibor Bercei, Telecommunications Research Institute, Dr Geza Gordos, Budapest Technical University, Dr Gyorgy Lajtha, Postal Experimental Institute, Dr Ivan Szep, Technical Physics Research Institute, and Dr Gyula Tofalvi, Telecommunications Research Institute: "Optical Communication," abbreviated version of a status survey study prepared by the Telecommunications Systems Committee of the Hungarian Academy of Sciences. Received for publication 19 November 1983.]

### [Excerpts] Summary

The article describes the present status of optical communication on the basis of international data. Special emphasis is given to showing that this technique is already beyond the experimental stage. Optical communication will be a well defined, economical element of network construction in the years ahead.

#### 4. Domestic Situation and Goals

##### 4.1 Developmental Efforts

A number of institutions have done research and development and organizational work in recent years in the interest of domestic application of optical communication.

In addition to a number of status surveys, two OMFB [National Technical Development Committee] studies were prepared which will serve as the basis for development in the future.

The Telecommunications Research Institute received the commission to coordinate research and development within the framework of the OKKFT [National Medium-Range Research and Development Plan]. The Telephone Factory, as general contractor, coordinates industrial development, and the Telephone Factory manufactures the most expensive part of a photo communication link, the PCM and equipment.

Transmitter elements for optical communications systems are now made almost exclusively of semiconductor materials. The 'illuminating diodes' emit incoherent radiation in the 0.7-1.3 micrometer wave length range while modern laser

diodes emit coherent radiation in the 0.7-1.7 micrometer range. Light output can vary between 0.1 and 100 mW depending on design and material. Research and development on such light sources, primarily laser diodes emitting under 1 macrometer, is being done here in the Technical Physics Research Institute of the Hungarian Academy of Sciences. It will prepare 50-100 samples in the Sixth 5-Year Plan. These devices can be used for short range transmissions (L less than 1 km).

The most frequently used detectors in the under 1-micrometer range are the silicon PIN or cascade photodiodes. The Microelectronics Enterprise is capable of developing these on the basis of technologies developed earlier in the HIKI [Signal Technology Industry Research Institute].

The Hungarian Post Office has decided to set up an experimental link and to use optical communication widely on the basis of experiences with this. These tasks have been entrusted to the Postal Experimental Institute, where they have prepared installation plans and transmission instructions.

The Hungarian Post Office laid the first optical communications cable in October 1983 and it will be placed into experimental operation shortly.

Coordinated research and development began in the fall of 1983 with the cooperation of the Telephone Factory, the Telecommunications Research Institute, the Postal Experimental Institute, the Technical Physics Research Institute and the Microelectronics Enterprise. The goal of the work is to prepare sample links using primarily domestic and socialist parts and fibers.

#### 4.2. Applications Areas

The experiences which can be derived from various forecasts and from the decisions of various postal directorates can be evaluated in different ways for the various network levels domestically.

In the area of the subscriber network the light conducting technology will come into the foreground if landline program distribution and broad band information transmission become practical requirements. The practice of the German and French postal services show that subscriber optical network experiments have been realized in connection with other programs. But these programs can be introduced in a broad sphere only if all the parts needed for it can be ensured. One cannot expect a supplementing of the subscriber networks in the Hungarian Post Office net with broad band extra services in the near future. Thus the possibilities deriving from the optical technique can be expected to be realized in the subscriber net only at the experimental level in the period between 1984 and 1990.

In the area of trunk networks it is not economical to satisfy traffic needs by building new bulk channels, and in many cases the opening up of roads connected with this will not be permitted either. Instead of this one must select from among the following three possibilities:

--placing primary PCM systems into operation on the existing copper core cables; this is possible if the shafts are not overcrowded and if the quality of the cables is satisfactory;

--setting up microwave digital links between those points where there is line of sight; this solution may be preferred in many cases;

--setting up optical cables with tertiary PCM systems, which is favorable especially in those cases where there are empty openings in the bulk channels or where the capacity provided by an optical communications cable makes possible utilization of the openings.

The latter case can be expected to occur frequently in the trunk network, so it appears economical for the trunk network plans to be prepared in the 1984-1990 period to take optical communication into consideration as a practical possibility.

In the case of the rural network the traffic needs will not justify in every case the building of optical cables which make possible the creation of several hundred channels. But it may be economical on the lines of poles which are common with the heavy current network and it would greatly simplify fulfillment of the life protection regulations. Use of overhead optical cable in the rural network would be economical if digital switching technology appeared there at the same time.

The interurban main line network was built in our homeland not long ago with modern elements. Replacing these in the next decade would not be economical. But optical cable might be considered for construction of bypass lines or primary lines in new directions.

On the basis of the above it appears that when building up the domestic net the element of the trunk networks which can be used most economically in the near future is cable which can be drawn through a bulk channel. Light conducting overhead cable could be introduced in node sectors to be digitized. Going beyond this, optical communication links could be used for long distances toward the end of the decade in some new main directions.

8984

CSO: 5500/3024

SUPERVISORY, REMOTE CONTROL EQUIPMENT FOR TELECOMMUNICATIONS NETWORKS

Budapest HIRADASTECHNIKA in Hungarian No 3, 1984 pp 105-112

[Article by Istvan Kerecsen, Mihaly Varady Szabo and Balazs Ghymes, of the Telecommunications Research Institute: "A Universal Remote Control System for Communications Networks"; received for publication 21 Oct 83]

[Excerpts] Summary

A new remote controlled system based on a microcomputer has been prepared for use in communications networks. The TK-80 system has a number of new remote control services which make possible the construction of integrated supervisory and remote controlled networks. After a review of the customary and the new remote control services we describe the data transmission procedures and data collection processes used in the TK-80 system and the processing of the remote control data. After describing the hardware structure and software characteristics of the equipment we detail a few concrete equipment variants.

Introduction

Remote controlled systems based on microcomputers are being developed in Hungary which are suitable for building up integrated remote control networks also.

The TK-80 microprocessor remote control system is part of the KTT-80 and GTT-80 microwave radio relay equipment family. The basic developmental goal for the system was to make it possible to develop economically smaller supervisory systems with various versions of the equipment and to make it possible to build up modern integrated remote control networks with the equipment whose services would aid automation of the operational activity. We designed the TK-80 remote control system primarily to carry out remote control tasks in communications networks, but its structural possibilities and services also make its use in materials and energy transport networks possible.

8984

CSO: 5500/3024

INTER-AMERICAN AFFAIRS

ANDEAN PACT COUNTRIES PLAN JOINT SATELLITE

PA190319 Bogota EL TIEMPO in Spanish 13 Sep 84 p 9 B

[Article by Fabiola Beltran]

[Text] Yesterday, the Colombian Government admitted that the earth's stationary orbit is congested and that 85 percent of the South American orbital arch is occupied or reserved by countries that are not located in that area of the continent, mainly the United States, which occupies 82 percent.

This information was revealed by National Enterprise for Telecommunications [Telecom] President Herman Gonzalez Sorzano, and Gerardo Mesias, chief of Telecom's international affairs office. They revealed that according to calculations, the probable access of South American countries to that space is only 13 percent.

They said that in view of this situation, Colombia has exerted pressure at the Union for International Telecommunications, UIT, to have the current occupation of the orbital arch discussed at the international conference on space services in the earth's stationary orbit which has been scheduled for August 1985.

At the conference, the Colombian commission will also demand that the South American orbit segment be defined between grade 58, located on its limits with Ecuador, and 128 east, over the Pacific Ocean.

The commission will also discuss "Colombia's problems with the United States which began when the latter arbitrarily changed the orbit of its Usasat 8B satellite, which had been originally scheduled to be at grade 62 west, to grade 72 west over Colombian territory, thus violating the existing procedures of the telecommunications regulation and ignoring the Colombian thesis on the earth's stable orbit." Colombia has contributed this issue to the agenda that will be discussed at next year's meeting.

The Telecom officials' statements were issued within the framework of a forum on "the future world of television" which was held yesterday at the Gonzalo Jimenez de Quesada Convention Center. The forum, organized by the National Association of Advertisers, ANDA, included the participation of

Communications Minister Nohemi Sanin, who referred to the draft bill for the reorganization of National Institute of Radio and Television [Inravision] and television companies, which was presented at the ministers' council meeting on Tuesday.

#### Reorganization of the Television Systems

The draft bill will change Inravision into a state-owned organization that works for the people so that it is not arbitrarily mismanaged or altered by each new administration.

The government official said that the new organization foresees the creation of four divisions:

A national television council, as the primary division, which would include the government's participation, but not as a majority of the council in case a decision comes up for adoption. The council would be in charge of the television programs and bids.

A commission to supervise television; it would be in charge of controlling the quality of all of the services, the defense of citizens' rights, and copyrights. The commission would be comprised of representatives of different union and professional organizations.

An administrative board, with a minority government representation.

Lastly, a director of the institute appointed for a fixed term. He would not be the president's agent and his appointment or removal would not be a presidential decision.

#### The Andean Satellite

The forum on the future of television also discussed the feasibility of a joint satellite for the Andean Pact countries.

The president of Telecom said that since the organization's financial capabilities were not enough to launch a Colombian satellite, the plans were postponed. The decision was made to begin surveys to start a joint project with member countries of the Association of Andean State Telecommunications Enterprises, ASETA.

A decision on this project, which is scheduled to begin operations in 1991 or 1992, will be adopted late in September during a meeting of communications ministers from the area.

ASETA President Jaime Aguilera explained that as a first contribution to the project called Condor and to gain joint experiences, Bolivarian countries will jointly lease Intelsat channels as of 1985. The organization is used by Andean Pact countries to develop their international communications. According to Aguilera, this first initiative represents economic advantages for all ASETA members.

The Condor project's operating range would be concentrated on the group's five countries and it would reserve the orbit positions where the satellite would be placed at the UIT. There would be one position at grade 74 (Colombia) and two more at grades 77.5 and 89 in Ecuador.

According to the ASETA directorate member, investment costs for 1987 would total \$309 million, taking into consideration that the satellite will have 24 responder beacons.

CSO: 5500/2077



CLIZA PROVINCE TO RECEIVE AUTOMATIC TELEPHONE EXCHANGE

La Paz EL DIARIO in Spanish 29 Aug 84 p 6

[Text] Cliza, Cochabamba--Difficulties created by some technicians of the Ministry of Transport and Communications, who sought to install an automatic telephone exchange in Punata, have now been resolved. The technicians had broken a specific undertaking made by Adalid de la Torre, subsecretary of communications, who in April 1984 officially promised that the automatic equipment would be installed in Cliza, with manual connections to Punata, Tarata, Arani, Villa Rivero, Ucurena, Tolata, Tiraque, and other towns in the Valle Alto area.

In connection with the installation of the equipment, engineers Franklin Rivera and Clovis Velasquez, respectively technical advisor of the Subsecretariat of Communications and inspector general of communications, met with representatives of the Telephone Services Committee and the Civic Committee of Cliza on 17 August and signed an agreement which provides for the implementation of the original project. This involves the installation of the automatic telephone exchange in Cliza.

Commitment

At the same time the Ministry of Transport and Communications has committed itself to implementing a pilot project concerning a rural telephone system, using its own personnel and those from ENTEN and DITER, the Brazilian firms supplying the equipment. It has also been agreed that the two firms will provide the necessary personnel to handle future technical and administrative problems involved in the functioning of these telephone systems.

The terms of the recently signed agreement also provide for the telephone service to subscribers in Cliza and the installation of public telephone booths in the towns of Punata, Tarata, Arani, Ucurena, Toco, Tolata, Tiraque, Villa Rivero, and Arbieta. This will ensure effective, speedy, and reliable service, with semiautomatic connections throughout the country and internationally.

In the installation of the system, equipment and materials provided by ABC Sisters and Ericsson of Brazil will be used. This equipment and materials is now on hand in Cliza. Later on, other equipment will be provided in

accordance with demand. In addition, new services will be provided which will make it possible to install telex, data processing, facsimile and data transmission, and other equipment.

#### Communications System

Finally, the Ministry of Transport and Communications will assign to the Directorate of Telecommunications the study of an appropriate list of charges, on the basis that the system will provide a social service in rural areas which will make possible access by the great majority of the people and the integration of the communications system.

5170

CSO: 5500/2073

ENTEL EXPANSION PROJECT TO BENEFIT MINING, FARMING REGIONS

La Paz EL DIARIO in Spanish 15 Aug 84 p 5

[Text] The National Telecommunications Company [ENTEL] has presented a project for the expansion of the National Telecommunications Network in the course of 1985. This project will benefit 81 towns in the Departments of La Paz, Cochabamba, Oruro, Chuquisaca, Potosi, Tarija, and Santa Cruz.

The project takes into consideration an expansion of service to the smaller towns in the mining and agricultural and livestock regions of the country, making use of existing infrastructure in the Microwave Trunk Network.

This program involves providing totally automatic service and includes both long distance from central telephone exchanges, landline transmission systems, and coin-operated and conventional telephone equipment.

The towns to be provided with this service, by departments, are as follows: 17 towns in La Paz, 17 in Cochabamba, 12 in Oruro, six in Chuquisaca, 16 in Potosi, 11 in Tarija, and two in Santa Cruz. This adds up to 81 towns.

The project involves the installation of 13 telephone exchanges and switching centers in different towns which at present do not have local telephone service but which have an initial potential of 6,674 users and 27,527 users in the final stages of implementation of the project.

Regarding the transmission of telephone calls under the project, provision has been made for the installation of 142 sets of 6, 24, 60, and 120 channel UHF radio equipment with 71 telephone links; six sets of 300 channel microwave equipment with three telephone links; 16 multipurpose sets; and 78 radio terminal sets.

In terms of energy required, it has been noted that nonconventional energy will be used, for the most part, in an effort to reduce maintenance costs and expenditures on fossil fuels. In this connection provision has been made for the installation of 53 solar energy systems and 29 emergency electricity generators.

Civil engineering work to be carried out in the implementation of the project consists of the construction of 12 buildings for the installation of radio

terminal equipment and switching centers, as well as the construction of new repeater stations for transmission equipment. This construction will include 3,870 square meters of floor space and 70 kilometers of access roads.

According to project estimates, it is believed that during the first year of service 5,880,000 local calls will be generated, consisting of 6,650,000 minutes of conversation originating in the newly-serviced towns and 5,760,000 minutes of conversation originating in the rest of the country and directed to users in the newly-serviced towns.

This anticipated traffic reflects an increase of 53 percent over the telephone traffic originated in the country in 1982.

The initial, estimated investment in the project will amount to \$46,783,678, of which \$31,057,391 are for the foreign exchange costs of equipment and some services. The remaining \$15,726,287 will be spent in local currency for the construction of buildings, repeater stations, roads, installation services, and domestic consulting services.

5170

CSO: 5500/2073

## INDIA

### BRIEFS

TV TRANSMITTERS COMMISSIONED--A TV transmitter was commissioned on 12 September at Sholapur. It is the 127th TV transmitter in the country and the 13th in Maharashtra. It will cover an area of 1,900 square km with a population of nearly 800,000. [Excerpt] [Delhi Domestic Service in English 1230 GMT 12 Sep 84] A TV transmitter was commissioned at Rauchur in Karnataka. This is the 128th TV transmitter in the country. It will have a range of 25 km and will cover a population of more than 300,000. [Excerpt] [Delhi Domestic Service in English 1230 GMT 13 Sep 84] The 129th TV transmitter was commissioned today at Jaisalmer in Rajasthan. It will cover an area of 1,800 square km with a population of 30,000 [figures as heard]. [Excerpt] [Delhi Domestic Service in English 1530 GMT 14 Sep 84] A TV transmitter was commissioned today at Parbhani in Maharashtra. It will cover an area of 2,000 square km with a population of about 350,000. It is the 130th TV transmitter in the country. [Excerpt] [Delhi Domestic Service in English 1530 GMT 15 Sep 84]

SHORTWAVE TRANSMITTERS AT ALIGARH--The information and broadcasting minister, Mr H.K.L. Bhagat, inaugurated two new high-powered shortwave transmitters of All India Radio at Aligarh in Uttar Pradesh 14 September. With this the number of such transmitters at Aligarh has gone up to four. Speaking at a function at Aligarh Muslim University campus, Mr Bhagat said the additional transmitters will further strengthen the external broadcasting and will go a long way in projecting the achievements of the country. He said the new transmitters will also bring about qualitative improvement in the broadcast. [Text] [Delhi Domestic Service in English 1230 GMT 14 Sep 84]

BICHANNEL TV PROGRAMS--The country is going to have its bichannel TV programs to be telecast from New Delhi this evening. The channel will be inaugurated by the prime minister at 1900. The program will be telecast from channel 7, band 3, for 2 hours daily. It will have one news bulletin besides other programs. [Text] [Delhi Domestic Service in English 0830 GMT 17 Sep 84]

PTI-XINHUA SATELLITE LINKUP--The PRESS TRUST OF INDIA [PTI] and the Chinese news agency XINHUA have set up a two-way satellite link. It is the 10th of its kind established by PTI with foreign agencies as a part of its project to expand its international coverage. The link will help strengthen the Organization of Asia-Pacific News Agencies of which both PTI and XINHUA are members, apart from widening the exchange of news between the two countries. [Text] [BK141404 Delhi General Overseas Service in English 1330 GMT 14 Sep 84]

CSO: 5500/4754

OFFICIAL DESCRIBES TELECOMMUNICATIONS SITUATION

Khartoum AL-SAHFAH in Arabic 11 Aug 84 p 7

[Interview with telecommunications official Eng 'Abdallah Muhammad Yasin by 'Abd-al-'Aziz Hasan Salih in Khartoum: "Satellite and Microwave Networks: Problems, Solutions and Development"; date not specified]

[Text] Communication is a social phenomenon that sets man apart from all other creatures. Moreover, man's increased dependence on the support of others renders him in constant need of communication and contact with others. Sudan, as the largest African country with its vast regions and distant villages, urgently needs a telecommunications system that can link its various regions, break the barrier of time and distance and help put it on the road of anticipated economic, cultural and social progress.

Therefore, the Sudanese microwave network and the space network projects are considered one of the country's development props. In an attempt to seek out the many problems and difficulties facing these two pioneering projects, it was necessary for us to meet with one of those involved in this problem who is concerned with this matter in order that we may perhaps do our share in bringing it out so that the competent sides will find a solution for it.

In his third-floor office in the telephone office building in Khartoum, I met with Eng 'Abdallah Muhammad Yasin, director of the transmission network of the General Telecommunications Institute, and had the following dialogue:

[Question] Several ground satellite stations went out of order in a number of cities and some of them are still out of commission. Why? And what measures have been taken to resume operation?

[Answer] The fact is that the satellite network (DOSAT) was set up in 1977 as a quick and temporary solution to bolster the national transmission network which should have been built with microwave networks. However, in 1977 we preferred to link some remote areas in the Sudan by means of satellite networks, which are faster and cheaper than microwave networks. But this project began facing some problems and difficulties due to the lack of necessary spare parts because of the unavailability of foreign financing. We brought this problem to the attention of officials several times and are now in the process of bringing in spare parts by means of American commodities aid; we expect them to operate satisfactorily in the future.

## Direct Contact with Satellite Network

[Question] Why is there no direct contact via these stations as is the case with the microwave network?

[Answer] This space station was supposed to operate on this pattern of direct contact, but they were set up in locations where electric power is not available and depended primarily on generators brought in with the equipment. These generators lost efficiency as time passed. Even in Khartoum there is a problem operating these sets, which were supposed to provide direct contact. However, the irregular electric current in Khartoum make it impossible to put this kind of contact in operation because these are very sensitive sets and are in fact computers (centerlife) [as given, perhaps a trademark] which require a steady electric current which is not available due to persistent power outages.

## New Station

[Question] Is there a plan to establish new regional stations, and if so, where?

[Answer] At present, a station will be built in Port Sudan to support the present microwave network which is having some problems. The Port Sudan national station is one of those stations the institute plans to build. A contract has already been signed with a French company to build that station, which was supposed to have been completed last July, but due to some obstacles that faced us, we expect it to be finished soon.

## Microwave Problems

[Question] Ever since it was built, the microwave network has been plagued with some problems. Why?

[Answer] The network that links Khartoum, Port Sudan, Sannar al-Abyad and Sannar Kasla was finished in 1977. It has been plagued with some problems due to the lack of fuel in some locations and sometimes due to the difficulty of getting fuel up to elevated locations. Furthermore, the equipment consumes a lot of energy because it runs on diesel generators. Each station is equipped with two generators according to the equipment's design. Only one is supposed to be in operation and the other is an alternate reserve so that they would not break down at the same time. However, these generators became the main problem and, following a study, we have decided to replace part of the equipment between 'Atbarah and Port Sudan because most of it is on high mountains, with reduced equipment that consumes less energy so that we may use solar energy that will save us many problems because we can use batteries that will supply the sets with energy storage and electric power at night.

The contract for this project has already been signed and is expected to be completed within 15 to 18 months, when subscribers will notice a great difference in performance.



## Distances Between Stations

[Question] The building of the microwave network was coupled with the building of relay stations 51 km apart. This experiment proved a failure, so is there a plan to replace these stations with more efficient ones farther apart?

[Answer] That the stations were built 51 km apart is false information since the distance between one station and another is governed by many factors. The distance between one station and another may be 40 km in one place and 60 km in another, depending on the topography between the stations. Basically, the distance between those stations is between 40 and 60 km.

As for the current problems at the Port Sudan network, they are not at all related to this reason but rather to the problems of fuel, energy and the very high attitudes of some stations which make them difficult to reach.

At any rate, we have studied such a problem and the new link to be built will take this point into account. Because we have lowered some stations to easy-to-reach locations, we have had to shorten the distances.

## No Labor Problems

[Question] Do you have a shortage of trained technical labor on top of these problems?

[Answer] On the contrary, the Telecommunications Institute is turning out more than we need of trained personnel in order to account for migration and emigration. As far as the labor force is concerned, we have no problems whatsoever.

## Contact with the Outside World

[Question] What about direct international communications?

[Answer] In this domain, the institute has taken big steps which we hope the people will notice soon. An international communications center, linking 3,300 local and international trunks, has been built in Khartoum and there are other steps to begin work on direct international contact besides the ARABSAT project. Added to that is the expansion of the station whereby the station's transmission system will be adjusted and another system introduced to provide more circuits because our station, which was built in 1974, has 36 circuits for telephone and telex communications, some of which are leased to private parties. We expect this number to increase to 217 circuits in the very near future because the station's expansion will provide 60 circuits plus 97 circuits provided by the ARABSAT project and 24 circuits by the Petroleum White Nile Network project from the international station at Umm Hiraz. People will be able to have direct contact with any place in the world. Some existing telephone centers will have new equipment to facilitate international contact.

[Question] When will that occur?

[Answer] Within 3 to 6 months when special equipment is received and the expansion of the Umm Hiraz station is completed.

[Question] Will people have to wait until then, and will complaints about the international station persist?

[Answer] We are aware of the very tight bottleneck in incoming and outgoing international communications owing to the small number of available circuits (36 circuits), 8 of which are for telex, about 3 or 4 for private communications and the rest for telephone calls. Naturally, these numbers are much lower than what is needed to provide for a better and more comfortable situation, and we hope to solve this problem soon. Concerning the telex, there is no difficulty because the 8 circuits are sufficient because each of them provides 46 circuits for various parties, particularly since the telex is the vital method of communication on which the economy depends to a large extent.

#### Competition Among Employees for Better Performance

[Question] There is a persistent complaint about the international telephone center's employees and talk about favoritism and so on.

[Answer] This may have been so in the past but not anymore. A large amount of international contact is done via an international direct dialing center recently built and staffed by a certain group of employees who compete in productivity because every employee is responsible for his own productivity. This is in addition to periodic incentive awards for anyone who can make best use of the circuit in the number of calls put through. We in the institute do not allow such a charge to exist because the institute's income depends largely on the yields from international calls. Therefore, we give this area great attention and impose on it strict control. Furthermore, we assume that our employees' dealings with the public are proper and acceptable.

I must not fail to mention that some lines between us and other countries are limited and inadequate, which may cause some inconvenience to the public.

#### Ratio of 3.3 Telephones per 1,000 Persons

[Question] People suffer from slow telephone service. Why? What is the present telephone ratio? Is it adequate? And what are your future plans in this regard?

[Answer] This difficulty is due to the fact that some established lines did not follow the designated program, thus leading to the unavailability of new telephone services because the capacity of centers in operation presently has been taxed to the maximum. We have several plans for establishing new centers whereby service will be improved.

Concerning the ratio of telephone sets, it is about 3.3 telephones per 1,000 citizens, which is considered very low. Our objective was to provide 1 telephone set per 100 citizens and we hope to achieve it soon. The situation is much better in the capital where the ratio will jump to more than 4 sets per 1,000 citizens after the modernization of cables and the renovation of the Bahri and Umm Durman centers.

[Question] When will the Bahri and Umm Durman problems be over?

[Answer] In this regard, I would like to talk about the project to renovate the Bahri and Umm Durman centers, which are operating with old equipment that was supposed to have been replaced long ago. We have invited international tenders for this project and have been in the process of examining them since the middle of last July. We expect this project to provide 10,000 lines for the Umm Durman center, a 3,000-line increase over the present capacity, and 7,000 lines for the Bahri center, a 3,000-line increase.

[Question] How have the people responded to this project which has been put up for implementation through self-support, and who will finance it if the money is not raised from the people?

[Answer] The institute submitted several alternatives to overcome the problem of financing urgent projects. One of these alternatives is the tendency toward self-support, which is preferred. Otherwise, we will depend on financing by companies which bid for this project.

[Question] When will this project be completed?

[Answer] This is considered a very urgent project and, therefore, renovation will take place via the importation of ready, easy-to-install equipment to be connected to the local cable network. We expect this to be done within a few months.

(It is known that a popular committee for the development of telephone service in the city of Bahri had been formed under the chairmanship of the Bahri Socialist Union secretary in March, 1984. The minister of transportation instructed it to speed up its work so that the project would be finished at the end of this year. The land has already been allotted and the cost will be defrayed from the cost of calls.)

[Question] What about the other centers?

[Answer] No problem, since they are newly built. There are some centers that are strictly operated through subscribers and these need to operate at maximum capacity. I mean the al-Mahdiyah and al-Imtidad and Shanmbat which have an average of 2,000 to 3,000 lines and were put into operation right after completion due to increased demand. The institute is now making efforts to expand these centers to provide the best possible service.

## ARABSAT

[Question] What about the ARABSAT project? What are its programs and how does it work?

[Answer] The ARABSAT will be launched in the fourth quarter of this year through a joint effort of the Arab countries that are members in the ARABSAT organization. Each Arab country must build a ground station that will provide contact with the rest of the countries via this satellite. Sudan has taken some steps forward in this regard. The station's specifications have been drawn up and tenders have been invited and examined by the company carrying out the project. It is expected to be completed within 15 months from now and will provide all kinds of communications services, including telephone, telex, telegraph and radio and TV broadcasts to and from any Arab country.

[Question] How will we benefit from this ARABSAT project?

[Answer] This project offers a great social and cultural benefit for the Arab nation in the interest of its peoples' unity and rapprochement. This is in addition to its economic benefits since, besides the communications service, it will also provide enough circuits among Arab countries which will directly support and revitalize economic and commercial activities among them. It will also provide us in the Sudan with about 97 circuits for international communications.

### Six-year Plan Provides 70,000 Lines

[Question] Can you please give us a brief idea about future plans and projects?

[Answer] We have many ambitious plans and projects, including the microwave link between 'Utayrah, Wadi Halfa and Aswan as one of the integration projects. In October, we shall begin our field and topographic survey of this link, which may run alongside the Nile and perhaps from Wadi Halfa to Abu Hammad via the desert to 'Utayrah along the railroad track. It will provide communications with Egypt via the microwave.

There is also the Qadarif-Qallabat-Dukah microwave link which will be executed within the framework of the African network communications project and will be submitted for tenders in the very near future.

And in the framework of the institute's next 6-year plan (1983-1989), there is a project providing 70,000 lines for 15 cities in the Sudan, including al-Hajj Yusuf and New Umm Durman, and the second and third stages will include the rest of the new residential expansions.

There is also a project to extend services to rural areas which comprises the renovation of centers in remote areas and the replacement of aerial lines by installing local medium-capacity automatic centers and using radio links.

Moreover, the institute undertakes activities in some other special fields. We participate in implementing special projects, the preparation of necessary studies, invitations to tenders and follow-up, such as our efforts, for example, in the al-Rahd national network project, the Kananah sugar project and the new Halfa institute project on which we are now working. That is because we have the trained and qualified cadres who have saved the country huge sums of money which was being spent on foreign advisors who did nothing but collect data from Sudanese engineers and technicians, and packaged it in elegant manuals and sold it to us at high prices without any effort on their part.

12502

CSO: 5500/4601

STATUS OF TELECOMMUNICATIONS NETWORKS REVIEWED

Forecasts to 1990

Milan TELECOMUNICAZIONI in Italian May-Jun 84 pp 1-9

[Article by Marisa Spelta, of the Central Strategic Planning and Marketing Department of ITALTEL: "Africa: Status and Development of Telecommunications Networks"--extracted from ITALTEL Project 801]

[Excerpt] Telecommunications Networks in 1982

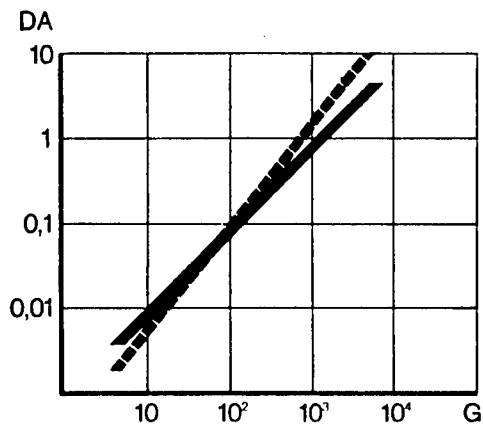
The basic features of telecommunications networks in Africa in 1982 can be summarized as in the table, in which for each country--in addition to the main features relating to telephone service, such as number of users and telephones--are given also, as indicators of the social-economic situation, the population and GNP. It can be concluded from the data that almost all the African countries have a subscriber rate of less than 3 percent, and a very modest GNP per capital (in general under 1,000 U.S. 1981 dollars). This general situation (with only two exceptions for telecommunications networks: Libya, with a subscriber rate of 3.9 percent and South Africa with 6.8 percent) puts this continent in last place on the world ladder for telecommunications networks, with an average overall subscriber rate of 0.85 percent and average telephone density of 1.49 percent. These density levels clearly indicate that in Africa's social-economic reality a direct relationship has not yet been created between that reality and the development opportunities available in telecommunications services.

This is clearly confirmed also by volume of telephone traffic, both urban and inter-urban: few countries provide data on their own traffic, and, even in countries where traffic is counted, the data supplied is inconsistent and therefore of little use.

In statistical terms, the correlation between telecommunications networks and economic development can be presented in the following diagram, which shows the relationship between subscriber density and per capita GNP in Africa.

The diagram compares the Africa status with the average world picture: the comparison shows that while in the world context telephone use is increasing more rapidly than per capita GNP (the exponent of parameter G is greater than one), in Africa the contrary applies. Thus, even as a general approximation, it can be concluded that telephone service in this area has not yet assumed

**Densità abbonati in relazione  
al GNP pro-capite**



(1) Correlazioni esistenti fra densità abbonati e GNP - pro-capite in Africa e confronto con la situazione mondiale

AFRICA = ——— MONDO = - - - -

(2) Valutazioni riferite alla situazione verificata in 40 Paesi dell'Africa e in 130 Paesi del mondo.

$$DA = 10^{-3} G^{0.97}$$

$$DA = 0,224 \cdot 10^{-3} G^{1.29}$$

(3) DA = densità abbonati (in %)  
(4) G = GNP pro-capite (in \$ USA '83)

**Density of Subscribers in Relation to GNP Per Capita**

Key:

1. Correlation between density of subscribers and GNP per capita in Africa, and compared to world situation.
2. Figures relate to established situation in 40 African countries and 130 world countries.
3. DA = Density of subscribers (in %)
4. G = GNP per capita (in \$U.S. 1983)

the role of a leading factor in social-economic development, but is on the contrary conditioned by that development.

In summary, one can say, therefore, that the African telecommunications networks--with the exception of a single country, the South African Republic--are definitely in the "embryonic" phase and that hence the issue of their role and the impact they could have in social-economic evolution, both in the various countries and the continent, has not yet materialized.

#### Development Forecasts Until 1990

In preparing the development forecasts for African telecommunications networks, we chose several countries--considered adequate to provide a meaningful sample of the African situation as a whole--to which were applied suitable "simulation models" of their social-economic situations to describe the development potential of their respective telecommunications networks.

As previously indicated, these models are based on the hypothesis, while taking into account the social, economic and cultural difficulties faced by virtually all the African countries, that local governments will undertake a conscious effort aimed at rational use of their own resources and of the assistance that they can obtain from the outside world.

The simulation models used consider primarily the following factors:

- Structural indications such as working population, its proportion to the total population, and its distribution among the basic employment sectors (primary, secondary and tertiary);
- Economic indicators such as GNP and contribution to it by various sectors;
- Indicators more specifically relating to telecommunications, such as the extent of the various applications (telephone, telex, etc) and of the relative traffic.

On the basis of the existing correlations between these indicators and their development possibilities, the simulation models make it possible to develop development forecasts of the various applications, and therefore of the installations. In regard to these, the models used are designed to obtain quantitative forecasts according to the following system sectors:

- Public exchanges;
- Transmission networks (including radio links);
- Private exchanges;
- Telex networks;
- Data transmission;
- Telephone terminals.



On the basis of development of installations, the average annual quantities of equipment are then estimated, taking into account specific cost situations.

The listed equipment costs refer exclusively to equipment used in the telecommunications networks, and therefore exclude the costs of physical support (urban and interurban cable) and the equipment needed for maintenance. It should be noted that these figures are annual averages and thus refer to the average annual market during the period considered, that is, 5 years. Also, the figures were calculated on the assumption that the increase in all system sectors, in the context of the average period, will be the same as the increase in relative applications.

In this forecast of development of African telecommunications networks the sample studied was composed of the following countries: Algeria, East Africa, Egypt, Nigeria and South Africa, which in 1982 together constituted 73 percent of African telephone use, although their populations account for only 30 percent of the continent's total.

In respect to size of networks and of markets, the results of the aforementioned simulation models for the period until 1990 can be presented as shown in the following table, in which, for comparison, are also shown the related figures for the 5-year period 1976-1980.

The development forecasts for the five countries studied in detail provide information that makes it possible, though in a very approximate way, to estimate the dimensions of the entire African market.

Using adequate extrapolation methods, which must obviously take into account the individual realities of the other African countries and their specific socio-economic characteristics and peculiarities, estimates were in fact made of the dimensions of the continent-wide market in respect to the various system sectors.

The figures presented indicate the importance of the public exchange sector (which accounts for more than 47 percent of the entire continent market), followed in order by transmission (19 percent) and private exchanges (14 percent). In this context, which estimates for the entire sector an average annual market increase of over 10 percent, the higher annual rates are indicated in the sectors of terminals and transmission, more than 14 percent.

There follow tables in greater detail on the situations and development estimates for the five African countries studied in detail.

#### Note on Estimate Methodology

The calculation of the development situation of each individual country was carried out, as previously pointed out, using a simulation model that uses as primary reference point the economic, social and general structural situation of the past decade and the specific characteristics and development potentials. In this context, the dimensions and characteristics of the principal economic sectors--primary, secondary and tertiary--assume particular

Africa--Status of Telecommunications Networks (as of 1 January 1982)

Country	Area km <sup>2</sup> x 1,000	Pop x 1,000	GNP tot bill \$U.S.	GNP p.c. x 1,000	Tels x 1,000	Tel dens %	Tel Subscr x 1,000 dens %	Urban traffic mill	Urban traffic p.c.	Interurban tffc mill	Interurban tffc p.c.
1. Algeria*	2,381.7	19,644	42.04	2,140	607	3.09	408	1,588	80.84	292.09	14.87
2. Egypt*	1,001.4	43,500	28.28	650	522	1.20	418	476	10.94	n.d.	n.d.
3. Libya	1,759.5	3,086	26.08	8,450	250	8.10	120	n.d.	n.d.	n.d.	n.d.
4. Morocco	458.7	21,909	18.84	860	241	1.10	177	n.d.	n.d.	1,258.56	57.44
5. Sudan	2,505.8	17,250	6.56	380	69	0.40	49	36	2.09	70.03	4.06
6. Tunisia	163.6	6,579	9.34	1,420	200	3.04	121	n.d.	n.d.	n.d.	n.d.
PARTIAL TOTAL	(8,270.7)	(111,968)	(131.13)	(1,171)	(1,889)	(1.69)	(1,293)	(2,100)	(25.12)	(1,620.68)	(27.56)
7. Ethiopia	1,221.9	33,667	4.71	140	101	0.30	77	315	9.36	3.52	0.10
8. Gambia	11.3	588	0.22	370	5	0.85	4	n.d.	n.d.	n.d.	n.d.
9. Ghana	238.5	11,833	4.73	400	71	0.60	39	n.d.	n.d.	0.38	0.03
10. Liberia	111.4	1,800	0.94	520	9	0.50	7	n.d.	n.d.	n.d.	n.d.
11. Malawi	118.5	6,207	1.24	200	18	0.29	14	n.d.	n.d.	n.d.	n.d.
12. Nigeria*	923.8	90,000	78.30	870	450	0.50	218	n.d.	n.d.	n.d.	n.d.
13. Sierra Leone	71.7	3,600	1.15	320	18	0.50	12	n.d.	n.d.	n.d.	n.d.
14. Somalia	637.7	4,412	1.24	280	15	0.34	12	n.d.	n.d.	n.d.	n.d.
15. East Africa*	1,756.7	48,904	15.16	310	357	0.73	152	n.d.	n.d.	n.d.	n.d.
16. Zambia	746.3	6,600	3.96	600	33	0.50	28	n.d.	n.d.	319.50	48.41
PARTIAL TOTAL	(5,837.8)	(207,611)	(111.65)	(538)	(1,077)	(0.52)	(563)	(315)	(9.36)	(323.40)	(6.21)
17. Benin (Dahomey)	112.6	3,676	1.18	320	25	0.68	10	n.d.	n.d.	n.d.	n.d.
18. Burundi	27.8	6,000	1.38	230	6	0.10	5	n.d.	n.d.	n.d.	n.d.
19. Cameroon	475.4	8,636	7.60	880	19	0.22	18	n.d.	n.d.	n.d.	n.d.
20. Chad	1,284.0	6,667	0.73	110	10	0.15	8	n.d.	n.d.	n.d.	n.d.
21. Ivory Coast	322.5	6,713	8.06	1,200	96	1.43	41	n.d.	n.d.	n.d.	n.d.
22. Gabon	267.7	524	2.00	3,810	11	2.10	11	n.d.	n.d.	n.d.	n.d.
23. Guinea	245.9	5,143	1.54	300	18	0.35	15	94	18.28	n.d.	n.d.
24. Madagascar	587.0	10,000	3.30	330	38	0.38	19	n.d.	n.d.	n.d.	n.d.
25. Mali	1,240.0	8,000	1.52	190	8	0.10	6	n.d.	n.d.	1.67	0.21
26. Mauritania	1,030.7	1,647	0.76	460	14	0.85	9	n.d.	n.d.	n.d.	n.d.

Africa--Status of Telecommunications Networks (as of 1 January 1982) (cont)

Country	Area km <sup>2</sup> x 1,000	Pop x 1,000	GNP tot bill \$U.S.	GNP p.c. x 1,000	Tels x 1,000	Tel dens %	Tel Subscr x 1,000 dens %	Urban traffic mill	Interurban tfc mill	p.c.
27. Niger	1,267.0	5,882	1.94	330	10	0.17	6	n.d.	n.d.	n.d.
28. Central African R.	622.9	2,000	0.64	320	10	0.50	7	n.d.	n.d.	n.d.
29. Rwanda	26.3	6,000	1.50	250	6	0.10	4	n.d.	n.d.	n.d.
30. Senegal	196.7	5,125	2.20	430	41	0.80	18	n.d.	n.d.	n.d.
31. Togo	56.6	2,667	1.01	380	8	0.30	6	n.d.	n.d.	n.d.
32. Volta [Burkina]	274.2	7,059	1.69	240	12	0.17	6	n.d.	n.d.	n.d.
33. Zaire (Congo)	2,344.9	1,500	0.32	210	9	0.60	9	n.d.	1.37	0.91
PARTIAL TOTAL	(10,382.2)	(87,239)	(37.37)	(428)	(341)	(0.39)	(198)	(94)	(18.28)	(0.32)
34. Angola	1,246.7	5,634	2.70	480	40	0.71	37	n.d.	0.58	0.10
35. Botswana	600.4	932	0.94	1,010	15	1.61	8	n.d.	n.d.	n.d.
36. Lesotho	30.4	1,373	0.74	540	7	0.51	5	n.d.	n.d.	n.d.
37. Mozambique	799.4	14,000	3.92	280	56	0.40	35	75	2.63	0.19
38. Rhodesia [Zimbabwe]	390.6	7,593	6.61	870	224	2.95	99	n.d.	n.d.	n.d.
39. South African Rep*	1,179.4	24,496	67.85	2,770	3,209	13.10	1,670	1,006	2,591.75	105.80
40. Swaziland	17.4	556	0.42	760	15	2.70	7	91	n.d.	n.d.
PARTIAL TOTAL	(4,264.3)	(54,583)	(83.19)	(1,524)	(3,566)	(6.53)	(1,861)	(1,172)	(30.01)	(2,594.96)
TOTAL	28,755.0	461,402	363.34	787	6,873	1.49	3,915	3,681	23.26	4,542.08
										27.61

\* Countries studied in detail.

East Africa is composed of Tanzania, Uganda, Kenya

n.d. "Data not available."

### Forecast Development of Population, Number of Telephones, and Ratio of Telephones to Subscribers

39

Age Annual Market Total Market

	Average Annual Market			Total Market		
	1976-1980	1981-1985	1986-1990	1976-1990		
	b.lire	%	b.lire	%	b.lire	%
Public exchanges	167.4	49.9	300.5	52.2	418.9	43.8
Transmission	53.8	16.0	96.6	16.8	209.5	21.9
(radio links)	(13.4)	(4.0)	(24.1)	(4.2)	(52.4)	(5.5)
Private exchanges	43.5	13.0	77.2	13.4	140.4	14.7
Telex networks	33.4	10.0	44.1	7.7	65.9	6.9
Data transmission	8.7	2.6	8.9	1.5	10.5	1.1
Telephone terminals	<u>28.4</u>	<u>8.5</u>	<u>48.5</u>	<u>8.4</u>	<u>112.3</u>	<u>11.7</u>
TOTAL	335.2	100.0	575.7	100.0	957.5	100.0
					9,341.7	100.0

Africa--Development of Telecommunications in Countries Studied in Detail (period 1975-1990)

Forecast Development of Population, Number of Subscribers, Number of Telephones, and Ratio of Telephones to Subscribers

	Population (X 1,000)				Number of subscribers (X 1,000)				Number of Telephones (X 1,000)				Ratio Tels/subs	
	1975	1980	1985	1990	1975	1980	1985	1990	1975	1980	1985	1990	1975	1990
Algeria	17,483	19,400	21,527	23,888	129	312	517	812	250	485	818	1,242	1.93	1.53
E. Africa	40,351	48,429	58,124	69,760	101	145	244	419	230	339	680	1,214	2.28	2.90
Egypt	38,542	42,200	47,800	53,800	345	405	626	1,049	495	506	770	1,291	1.43	1.23
Nigeria	58,824	80,000	108,799	147,966	94	184	316	592	200	383	751	1,480	2.13	2.50
S. Africa	<u>20,625</u>	<u>23,772</u>	<u>27,292</u>	<u>31,333</u>	<u>938</u>	<u>1,546</u>	<u>2,565</u>	<u>4,293</u>	<u>1,601</u>	<u>2,933</u>	<u>4,667</u>	<u>7,614</u>	<u>1.71</u>	<u>1.77</u>
TOTAL	175,825	213,801	263,542	326,747	1,608	2,593	4,268	7,164	2,776	4,647	7,685	12,841	1.73	1.79

Development of Market and Participation of Various System Sectors Forecast for Studied Countries  
(in billion lire at 1983 rate)

	Average annual market				Total market			
	1976-1980		1981-1985		1986-1990		1976-1990	
	b.lire	%	b.lire	%	b.lire	%	b. lire	%
Public exchanges	167.4	49.9	300.5	52.2	418.9	43.8	4,433.7	47.5
Transmission	53.8	16.0	96.6	16.8	209.5	21.9	1,799.2	19.3
(Radio links)	(13.4)	(4.0)	(24.1)	(4.2)	(52.4)	(5.5)	(449.8)	(4.8)
Private exchanges	43.5	13.0	77.2	13.4	140.4	14.7	1,305.9	14.0
Telex networks	33.4	10.0	44.1	7.7	65.9	6.9	716.9	7.7
Data transmission	8.7	2.6	8.9	1.5	10.5	1.1	140.4	1.5
Telephone terminals	<u>28.4</u>	<u>8.5</u>	<u>48.5</u>	<u>8.4</u>	<u>112.3</u>	<u>11.7</u>	<u>945.7</u>	<u>10.1</u>
TOTAL	335.2	100.0	575.7	100.0	957.5	100.0	9,341.7	100.0

The dimensions of the continent-wide market for the various system sectors, calculated by the previously explained method, can be summarized as follows:

Africa--Overall Telecommunications Market Size

(in billion lire 1983)	Average annual market			Total market
	1976-1980	1981-1985	1986-1990	1976-1990
Public exchanges	208.6	401.7	528.7	5,695.0
Transmission networks	68.9	129.0	264.4	2,311.5
(Radio links)	(17.9)	(32.3)	(66.1)	(581.5)
Private exchanges	56.4	103.2	177.2	1,684.0
Telex networks	44.8	59.1	82.8	933.5
Data transmission	11.4	11.8	12.9	180.5
Telephone terminals	<u>37.0</u>	<u>63.2</u>	<u>141.8</u>	<u>1,210.0</u>
AVERAGE ANNUAL TOTAL	427.1	768.0	1,207.8	12,014.5

# 1 ALGERIA

## 1 General Characteristics as of 31 December 1981

1.1	Area	Thousand km2	2,381.70
1.2	Population		
	Residents	Thousands	19,644.00
	Density	Per km2	8.25
	Working population in employment sectors	Thousands	4,224.00
	Agriculture (primary)	Thousands	858.00
	Industry (secondary)	Thousands	1,115.00
	Services (tertiary)	Thousands	2,551.00
1.3	National income		
	Gross (GNP)	Millions \$U.S.	42.04
	GNP per capita	\$U.S.	2,140.00
	Average annual increase (from 1971 to 1981)	%	3.10
1.4	Telephone sets	Thousands	607.00
	Average annual increase (for decade 1971-1981)	%	11.80
	Telephones per 100 population	%	3.09
1.5	Telephone subscribers	Thousands	408.00
	Degree of automation (Electronic = 0.0 %)	%	63.10
	Subscribers per 100 population	%	2.08
1.6	Urban traffic	Million ch.	1,588.00
	Urban traffic per capita	Ch. per person	80.84
1.7	Inter-urban traffic	Million ch.	292.06
	Inter-urban traffic per capita	Ch. per person	14.87
1.8	Data users	Thousands	n.d.
1.9	Telex users	Units	3,962.00
1.10	Stations for telecommunications via satellite	Units	2.00

## 2 Development of Telecommunications Networks

2 Development of Telecommunications Networks			1975	1980	1985	1990
2.1	Population	Thousands	17,483	19,400	21,527	23,888
2.2	Telephone sets					
	Number	Thousands	250	485	818	1,242
	Density	%	1.43	2.50	3.80	5.20
2.3	Telephone subscribers					
	Number	Thousands	129	312	517	812
	Density	%	0.74	1.61	2.40	3.40
2.4	PABX and PBX lines	Thousands	59.44	110.58	193.74	293.82
2.5	Telex users	Thousands	1.0	3.2	5.6	7.9
2.6	Data users	Thousands	n.d.	n.d.	n.d.	n.d.

In 1975-1990 the average annual percentage increase in number of telephone sets was 11.3%.

### 3 Market Forecasts for Telecommunications Networks (billion lire at 1983 rate)

	Average annual market			Total market
	1976-1980	1981-1985	1985-1990	1976-1990
3.1 Public exchanges	31.1	34.7	38.6	521.9
3.2 Transmission networks	10.0	11.2	19.3	202.2
including radio networks	2.5	2.8	4.8	50.5
3.3 Private exchanges	5.6	9.1	10.9	128.0
3.4 Telex networks	4.7	5.2	5.0	74.6
3.5 Data transmission	n.d.	n.d.	n.d.	n.d.
3.6 Telephone terminals	<u>3.6</u>	<u>5.1</u>	<u>8.4</u>	<u>84.9</u>
TOTAL	55.0	65.3	82.1	1,011.6

In 1975-1990 the average annual percentage increase in total annual market volume is 4.1%.

## 2 EAST AFRICA

### 1 General Characteristics as of 31 December 1981

1.1 Area	Thousand km <sup>2</sup>	1,756.70
1.2 Population		
Residents	Thousands	48,904.10
Density	Per km <sup>2</sup>	27.84
Working population in employment sectors	Thousands	20,148.00
Agriculture (primary)	Thousands	n.d.
Industry (secondary)	Thousands	n.d.
Services (tertiary)	Thousands	n.d.
1.3 National income		
Gross (GNP)	Millions \$U.S.	15.16
GNP per capita	\$U.S.	310.00
Average annual increase (from 1971 to 1981)	%	2.90
1.4 Telephone sets	Thousands	357.00
Average annual increase (for decade 1971-1981)	%	8.36
Telephones per 100 population	%	0.73
1.5 Telephone subscribers	Thousands	152.00
Degree of automation (Electronic = 0.0 %)	%	81.40
Subscribers per 100 population	%	0.31
1.6 Urban traffic	Million ch.	n.d.
Urban traffic per capita	Ch. per person	n.d.
1.7 Inter-urban traffic	Million ch.	n.d.
Inter-urban traffic per capita	Ch. per person	n.d.
1.8 Date users	Thousands	1.40
1.9 Telex users	Units	3,288.00
1.10 Stations for telecommunications via satellite	Units	4.00

## 2 Development of Telecommunications Networks

			<u>1975</u>	<u>1980</u>	<u>1985</u>	<u>1990</u>
2.1	Population	Thousands	40,351	48,329	58,124	69,760
2.2	Telephone sets					
	Number	Thousands	230	339	680	1,214
	Density	%	0.57	0.70	1.17	1.74
2.3	Telephone subscribers					
	Number	Thousands	101	145	244	419
	Density	%	0.25	0.30	0.42	0.60
2.4	PABX and PBX lines	Thousands	60.53	106.54	174.37	313.92
2.5	Telex users	Thousands	0.8	2.0	5.2	8.4
2.6	Data users	Thousands	n.d.	1.3	1.9	2.7

In 1975-1990 the average annual percentage increase in number of telephone sets is 11.7%.

## 3 Market Forecasts for Telecommunications Networks (billion lire at 1983 rate)

		Average annual market			Total market
		1976-1980	1981-1985	1985-1990	1976-1990
3.1	Public exchanges	7.5	16.8	22.8	235.5
3.2	Transmission networks	2.4	5.4	11.4	96.0
	including radio networks	0.6	1.3	2.8	24.0
3.3	Private exchanges	5.0	7.4	15.2	138.4
3.4	Telex networks	2.7	6.8	6.9	81.9
3.5	Data transmission	0.8	0.4	0.5	8.6
3.6	Telephone terminals	<u>1.7</u>	<u>5.2</u>	<u>10.5</u>	<u>86.8</u>
	TOTAL	20.2	42.0	67.3	647.3

In 1975-1990 the average annual percentage increase in total annual market volume is 12.8%.

## 3. EGYPT

### 1 General Characteristics as of 31 December 1981

1.1	Area	Thousand km2	1,001.40
1.2	Population		
	Residents	Thousands	43,500.00
	Density	Per km2	43.44
	Working population in employment sectors	Thousands	11,658.00
	Agriculture (primary)	Thousands	4,652.00
	Industry (secondary)	Thousands	3,392.00
	Services (tertiary)	Thousands	3,614.00
1.3	National income		
	Gross (GNP)	Millions \$U.S.	28.28
	GNP per capita	\$U.S.	650.00
	Average annual increase (from 1971 to 1981)	%	5.60



# EGYPT [cont]

1.4	Telephone sets	Thousands	522.00
	Average annual increase (for decade 1971-1981)	%	2.08
	Telephones per 100 population	%	1.20
1.5	Telephone subscribers	Thousands	418.00
	Degree of automation (Electronic = 0.0 %)	%	89.20
	Subscribers per 100 population	%	0.96
1.6	Urban traffic	Million ch.	476.00
	Urban traffic per capita	Ch. per person	10.94
1.7	Inter-urban traffic	Million ch.	n.d.
	Inter-urban traffic per capita	Ch. per person	n.d.
1.8	Date users	Thousands	n.d.
1.9	Telex users	Units	1,700.00
1.10	Stations for telecommunications via satellite	Units	1.00

## 2 Development of Telecommunications Networks

		<u>1975</u>	<u>1980</u>	<u>1985</u>	<u>1990</u>
2.1	Population	Thousands	38,542	42,200	47,800
2.2	Telephone sets				
	Number	Thousands	495	506	770
	Density	%	1.28	1.20	1.61
2.3	Telephone subscribers				
	Number	Thousands	345	405	626
	Density	%	0.90	0.96	1.31
2.4	PABX and PBX lines	Thousands	77.08	113.94	167.30
2.5	Telex users	Thousands	0.6	1.7	3.2
2.6	Data users	Thousands	n.d.	n.d.	n.d.

In 1975-1990 the average annual percentage increase in number of telephone sets is 6.6%.

## 3 Market Forecasts for Telecommunications Networks (billion lire at 1983 rate)

		Average annual market			Total market
		1976-1980	1981-1985	1985-1990	1976-1990
3.1	Public exchanges	10.2	37.6	55.2	514.9
3.2	Transmission networks	3.3	12.1	27.6	214.9
	including radio networks	0.8	3.0	6.9	53.7
3.3	Private exchanges	4.0	5.8	9.9	99.0
3.4	Telex networks	2.3.	3.3.	4.7	51.6
3.5	Data transmission	n.d.	n.d.	n.d.	n.d.
3.6	Telephone terminals	0.2	4.0	10.3	72.3
	TOTAL	20.0	62.7	107.7	952.4

In 1975-1990 the average annual percentage increase in total annual market volume is 18.3%.

#### 4. NIGERIA

##### 1 General Characteristics as of 31 December 1981

1.1	Area	Thousand km2	923.80
1.2	Population		
	Residents	Thousands	90,000.00
	Density	Per km2	97.42
	Working population in employment sectors	Thousands	32,760.00
	Agriculture (primary)	Thousands	n.d.
	Industry (secondary)	Thousands	n.d.
	Services (tertiary)	Thousands	n.d.
1.3	National income		
	Gross (GNP)	Millions \$U.S.	78.30
	GNP per capita	\$U.S.	870.00
	Average annual increase (from 1971 to 1981)	%	3.00
1.4	Telephone sets	Thousands	450.00
	Average annual increase (for decade 1971-1981)	%	17.86
	Telephones per 100 population	%	0.50
1.5	Telephone subscribers	Thousands	
	Degree of automation (Electronic = 0.0 %)	%	218.00
	Subscribers per 100 population	%	94.30
1.6	Urban traffic	Million ch.	n.d.
	Urban traffic per capita	Ch. per person	n.d.
1.7	Inter-urban traffic	Million ch.	n.d.
	Inter-urban traffic per capita	Ch. per person	n.d.
1.8	Date users	Thousands	n.d.
1.9	Telex users	Units	4,770.00
1.10	Stations for telecommunications via satellite	Units	3.00

##### 2 Development of Telecommunications Networks

<u>Development of Telecommunications Networks</u>			1975	1980	1985	1990
2.1	Population	Thousands	58,824	80,000	108,799	147,966
2.2	Telephone sets					
	Number	Thousands	200	383	751	1,480
	Density	%	0.34	0.48	0.69	1.00
2.3	Telephone subscribers					
	Number	Thousands	94	184	316	592
	Density	%	0.16	0.23	0.29	0.40
2.4	PABX and PBX lines	Thousands	40.00	64.00	119.68	236.75
2.5	Telex users	Thousands	2.0	4.0	6.5	10.4
2.6	Data users	Thousands	n.d.	n.d.	n.d.	n.d.

In 1975-1990 the average annual percentage increase in number of telephone sets is 14.3%.

### 3 Market Forecasts for Telecommunications Networks (billion lire at 1983 rate)

		Average annual market			Total market
		1976-1980	1981-1985	1985-1990	1976-1990
3.1	Public exchanges	15.3	22.3	36.1	368.4
3.2	Transmission networks	4.9	7.2	18.0	150.6
	including radio networks	1.2	1.8	4.5	37.7
3.3	Private exchanges	2.6	6.1	12.8	107.5
3.4	Telex networks	4.3	5.5	8.3	90.5
3.5	Data transmission	n.d.	n.d.	n.d.	n.d.
3.6	Telephone terminals	2.8	5.6	14.4	113.7
TOTAL		29.9	46.7	89.6	830.7

In 1975-1990 the average annual percentage increase in total annual market volume is 11.6%.

### 5. SOUTH AFRICAN REPUBLIC

#### 1 General Characteristics as of 31 December 1981

1.1	Area	Thousand km2	1,179.40
1.2	Population		
	Residents	Thousands	24,496.20
	Density	Per km2	20.77
	Working population in employment sectors	Thousands	12,224.00
	Agriculture (primary)	Thousands	n.d.
	Industry (secondary)	Thousands	n.d.
	Services (tertiary)	Thousands	n.d.
1.3	National income		
	Gross (GNP)	Millions \$U.S.	67.85
	GNP per capita	\$U.S.	2,770.00
	Average annual increase (from 1971 to 1981)	%	0.70
1.4	Telephone sets	Thousands	3,209.00
	Average annual increase (for decade 1971-1981)	%	7.05
	Telephones per 100 population	%	13.10
1.5	Telephone subscribers	Thousands	1,670.00
	Degree of automation (Electronic = 3.4 %)	%	91.80
	Subscribers per 100 population	%	6.82
1.6	Urban traffic	Million ch.	1,006.00
	Urban traffic per capita	Ch. per person	41.07
1.7	Inter-urban traffic	Million ch.	2,591.75
	Inter-urban traffic per capita	Ch. per person	105.80
1.8	Date users	Thousands	24.70
1.9	Telex users	Units	21,482.00
1.10	Stations for telecommunications via satellite	Units	3.00

## 2 Development of Telecommunications Networks

			1975	1980	1985	1990
2.1	Population	Thousands	20,625	23,772	27,292	31,333
2.2	Telephone sets					
	Number	Thousands	1,601	2,933	4,667	7,614
	Density	%	7.76	12.34	17.10	24.30
2.3	Telephone subscribers					
	Number	Thousands	938	1,546	2,565	4,293
	Density	%	4.55	6.50	9.40	13.70
2.4	PABX and PBX lines	Thousands	330.00	570.53	979.78	1,688.85
2.5	Telex users	Thousands	9.1	18.0	27.8	43.9
2.6	Data users	Thousands	2.9	15.0	27.0	40.0

In 1975-1990 the average annual percentage increase in number of telephone sets is 11.0%.

## 3 Market Forecasts for Telecommunications Networks (billion lire at 1983 rate)

		Average annual market			Total market
		1976-1980	1981-1985	1985-1990	1976-1990
3.1	Public exchanges	103.2	189.0	266.4	2,793.0
3.2	Transmission networks	33.2	60.8	133.2	1,135.6
	including radio networks	8.3	15.2	33.3	283.9
3.3	Private exchanges	26.3	48.8	91.5	833.0
3.4	Telex networks	19.3	23.3	41.0	418.2
3.5	Data transmission	7.9	8.5	10.0	131.8
3.6	Telephone terminals	<u>20.2</u>	<u>28.7</u>	<u>68.7</u>	<u>588.1</u>
	TOTAL	210.1	359.0	610.8	5,899.6

In 1975-1990 the average annual percentage increase in total annual market volume is 11.3%.

importance in terms of their effect, both in relation to the composition of working population and in relation to formation of GNP.

Other parameters of relevant importance are the literacy level, general economic situation (balance of payments, government deficit, foreign debt, etc.), distribution and concentration of population, basic resources, and dimensions of the primary structures, as well as the country's orographic structure. The models obviously do not take into account unpredictable and/or traumatic events.

Finally, in this context basic emphasis is placed on the situation of telecommunications networks and their development during the past decade. In this specific sector, the simulation model takes into account the confirmed relationship during the past decade between earnings and investments, and the effect of these on the GNP.

The development estimates for the decade considered are produced on the basis of comparison and correlation between two separate calculation methods:

--The first involves projection of historic data on the basis of what happened in countries which had general situations at the beginning of the preceding decade analogous to those in the countries under study;

--The second is based on projection of the economic developments and on the average correlations between this and the development of the communications networks.

However, it should be emphasized that the reliability of the estimates is directly correlated to the availability and validity of the "input" data, which, for many developing countries, is not available or frequently unreliable.

#### ITALCOM Projects in Mozambique

Milan TELECOMUNICAZIONI in Italian May-Jun 84 p 10

[Text] ITALCOM, a joint company of ITALTEL (IRI-STET Group), GTE and TELETTRA, will install Mozambique's new telecommunications network. The turnkey project will cost 85 billion lire and involve an area as large as Italy.

This is the first time that Italian companies will be carrying out abroad such a challenging telecommunication infrastructure project, which will use the most advanced technology and, in particular, the PROTEL system, based on the UT 10/3 digital exchanges of ITALTEL and the GTD-5C of GTE. The financing is guaranteed by the Department for Development Cooperation of the Ministry of Foreign Affairs, in the context of aid allocated to develop the planned infrastructure of the Southern Africa Development Coordination Conference (SADCC).

The ITALCOM project includes telephone exchanges for the equivalent of about 40,000 lines, transmission systems, and electric power supply systems. The

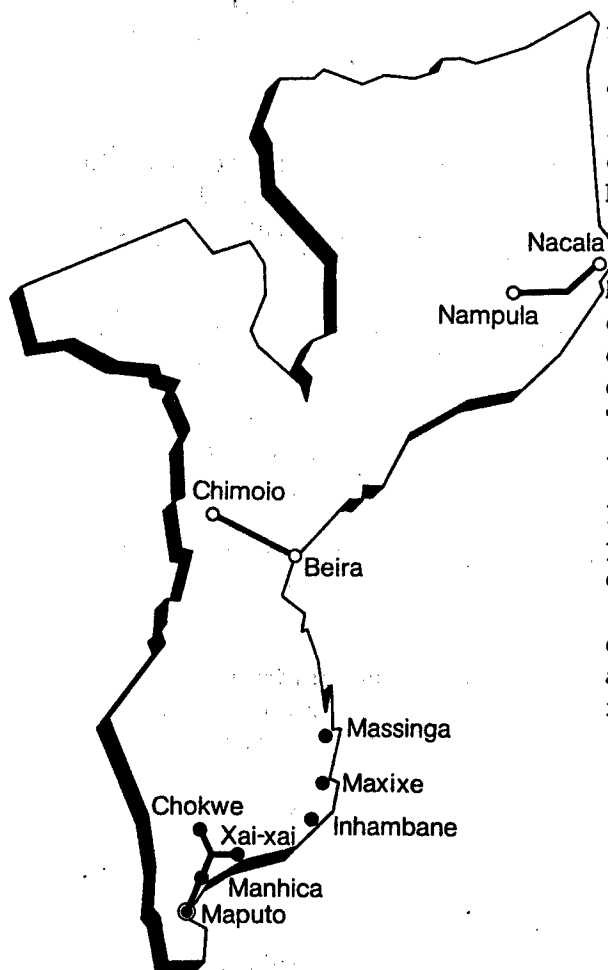
public exchange projects that ITALCOM will construct--as indicated on the map--are located in the southern part of the country and will also affect the capital, Maputo. These installations will amount to about two-thirds of the exchanges to be installed in the entire country in the next few years.

In regard to transmission lines, new links will be constructed also in the center and north of the country.

The project also provides for training of local personnel. In fact, ITALCOM will establish a training center that will put at Mozambique's disposal the Italian expertise in this field.

Mozambique selected the PROTEL system, chosen for the purpose of converting and expanding the telecommunications networks, over the main international competitors. The project is planned for completion within 5 years.

ITALCOM is responsible for the entire project in Mozambique, with the cooperation of the other Italian companies. CONSUTEL (IRI-STET Group), which had already contributed to the project, has been assigned to supervise technical implementation of the planned operations.



Key:

1. Public communication exchanges.
2. Transmission lines.

- (1) ● = Centrali di commutazione pubblica
- (2) — = Impianti di trasmissione

9920

CSO: 5500/97

SOUTH AFRICA

BROADCASTING CHIEF ON FUNDING

MB191919 Johannesburg Domestic Service in English 1900 GMT 19 Sep 84

[Text] The director general of the South African Broadcasting Corporation [SABC], Mr Eksteen, says the corporation is financially independent in that it obtains its revenue from advertising and license fees, and it is not true to say that the SABC wastes taxpayers' money. Addressing a meeting of the Johannesburg Afrikaanse Sakekamer [Afrikaans Chamber of Commerce], Mr Eksteen said that the only government funding--about 17 million rand in the present financial year--was for overseas radio service, broadcast for the state, and for formal education programs on black radio service.

Mr Eksteen said he would welcome it if the SABC's handling of advertising tariffs was analyzed and measured against other available advertisement figures. He said he was amazed the television advertising was always blamed for problems experienced by the press. Meanwhile, newspaper groups showed increasing group profits. He said the press still handled the biggest share by far of the advertising market. Mr Eksteen said the SABC had always been responsible in fixing advertising tariffs.

CSO: 5500/116

HUNDRED BILLION FRANCS TO BE INVESTED IN PHONE EQUIPMENT

Brussels LA LIBRE BELGIQUE in French 7 Aug 84 p 1

[Text] What would we do without the telephone? The question is even more unnecessary now that this piece of equipment, which is as indispensable to daily life as the knife and the fork, can be combined with micro-processors, automatic switching and numerical transmission--which allows us to plunge full speed into the world of tomorrow. In 10 years, not only will it be easier to communicate with your party but you will also be able to see him on a small screen that is part of the phone and to be connected to data banks, video texts, the onward transmission of documents, etc.

Today, in Belgium, the question arises, very prosaically, of a new 10-year contract for the delivery of, and equipment for, new numerical switchboards--the first step in this extraordinary technological revolution. In informed circles, there is already talk of the "contract of the century." It is true that it would require expenditure of a total of 80 to 100 billion Belgian francs over the 10 years. The former contract will expire next 31 December. It connected the RTT (Radio, Telephone and Telegraph Corporation) with two firms: Bell Telephone (80 percent) and GTE-ATEA (20 percent), the government thus avoiding any form of monopoly. The gold mine to which the electronic firms will have access is, of course, arousing their cupidity. The competition between north and south is manifesting itself (both Bell and GTE are installed in the northern part of the country and the Walloons would like to do something, too), but, in addition, the big international groups are entering the contest through their Belgian subsidiaries. Of course, there are Bell and GTE-ATEA but also the Philips-MBLE group, which has just signed a contract with the Americans' ATT; Siemens; ACEC, which is working hand-in-glove with Sweden's Ericksson; and the most recent arrival, the Societe Generale and the French firm Alcatel, which belongs to the Compagnie Generale d'Electricite (likewise French). To enliven the affair and complicate matters still more, there is a Bell-ACEC agreement (concluded before the ACEC-Ericksson agreement), and in this regard the parties concerned are observing a prudent silence.

In the services under the responsibility of Mr De Croo (minister of communications, posts, telephones and telegraph), there is gleeful anticipation. In this period of lean times for the government, every billion not spent is good news. "We are working in the spirit of being open to whatever may



happen," the minister of communications' technicians say. "Nothing has been done but everything is possible." In fact, the administrative services concerned have already consulted four large firms in Belgium to make a technical and technological survey of the situation--without any commitment, as the saying goes. As a result, a report will be drawn up on the kind of supplier to be sought for the "contract of the century," and this will be sent to the COC (Committee on Orientation and Coordination of Government Purchasing) in the near future. Once the choice is made, the government will give the go-ahead signal--no doubt in the course of 1985. Between now and then, a lot of water will pass over the community dam. Insofar as provision of the new telephone network (likewise numerical) is concerned, the pear has already had to be divided in two: ACEC and Siemens. Technically speaking, an identical operation with respect to the telephone switchboards would be no problem, since modern equipment of one manufacturer can be connected with that of another.

12336

CSO: 5500/2763

FRANCE

## SWEDEN JOINS FRANCE IN 'SPOT' SATELLITE PROJECT

Paris AFP SCIENCES in French 24 May 84 pp 31-32

[Text] Paris--On 17 May in Stockholm, during President Mitterrand's official visit to Sweden, and in the presence of Mr Laurent Fabius, French minister of industry and research, two Franco-Swedish agreements in the realm of remote sensing were signed, auguring well for the future of the SPOT [Earth Observation Probe System] program for the remote sensing of terrestrial resources.

"These two agreements are significant in more ways than one," said Mr Hubert Curien, president of the CNES [National Center for Space Studies], to AFP SCIENCES upon his return to Paris.

"Under the first of these agreements, our Swedish colleagues have decided to join us in the operational phase of the SPOT program and in the construction of the SPOT-2 satellite.

"The second agreement has to do with the distribution and use of data received from SPOT-1, which is to be launched in 1985 together with the Swedish scientific satellite 'Viking.' To handle this distribution and use, they have formed the 'Satimage' company.

"It was deemed desirable to sign an agreement between Satimage and its French counterpart Spotimage. The CNES and Spotimage thus acquired a small share in the capital ownership of Satimage. These are two good agreements. They bear out the exemplary nature of Franco-Swedish cooperation in the realm of space."

The first agreement is a codicil to the existing one between the CNES and the Swedish board for Space Activities dated 8 November 1978. It was signed respectively by Mr Curien and Mr Jan Stiernjstedt, chairman of the Swedish Board for Space Activities. It provides that Sweden will assign 14.3 million kronor (the same sum in francs), at July 1981 exchange rates, to the SPOT-2 satellite, for which it will furnish an onboard computer to be supplied by SAAB-SCANIA and certain components, and will share in the satellite launching costs in 1987.

The second is a financial agreement signed respectively by Mr Curien for the CNES, Mr Fredrik Engstroem for the Swedish Space Corporation, and Mr Gerard Brachet for Spotimage France. The CNES and the French Spotimage company will have a 6-percent and 4-percent participation respectively in the capital (15 million kronor) of the Satimage (Satellite Image in Kiruna Corporation) firm, created by the Swedish Space Corporation to operate the Kiruna receiving station and the distribution of the images received in Sweden via the French SPOT and American Landsat satellites.

Under the first Franco-Swedish agreement, the Swedish Space Corporation acquired a 6-percent participation in the capital (25 million francs) of the French Spotimage company 2 and 1/2 years ago.

Under the November 1978 Agreement, Sweden furnished the onboard computer for the SPOT-1 satellite, participated in its launch costs and equipped the Kiruna station in part with French equipment. In exchange, it had the use of an agreed amount of satellite orbit time for its needs in the domains of agriculture, forestry, environmental protection, and the inventorying of its natural resources.

9238

CSO: 5500/2755

# HIREL NAMED TO CABINET POSITION TO AID PTT MINISTER

Paris LE MONDE in French 7 Aug 84 p 21

[Text] Mr Hirel has been appointed to a task that could lead to a wide-scale reorganization of the PTT.

On 4 August, Mr Jean-Claude Hirel, director for the electronics and computer industries at the Ministry of Industry, was named deputy to Mr Mexandeau, minister delegate for post and telecommunications. His appointment falls within the broader context of the governmental policy in favor of the French electronics industry and an in-depth evaluation of the status and the future of the PTT.

The question of the status of the PTT has been raised in France, as the world over, following the "deregulation" and break-up of AT&T. Mr Hirel has been asked to conduct an in-depth evaluation of telecommunications, the mail service and the relationship between the two administrations. The government seems to be willing to reform the PTT gradually, taking the views of all into account, particularly the unions which are known to consider the unity of the PTT as very important.

The present public law structure does pose numerous problems when viewed against the world-wide prospect of an explosion and internationalization of communication markets. The "deregulation" of telecommunications in the United States, the "demonopolization" and the "privitization" brought into effect in Great Britain and in Japan, which are under study in a number of other countries, modify de facto the conditions of traffic flow and reorganize the existing networks.

The PTT must be able to act more quickly and with greater flexibility than in the past, but do not always have de jure the possibility to do so. French administration therefore had to affiliate some of its activities, the Transpac tele-data processing network for example, or for another, the marketing of transmitting capabilities via the Telecom I satellite.

In France, there is also the problem of the hook-up of the electronics industries with the PTT, which was done last summer. Data-processing and office electronics have moved to Avenue de Segur which is also responsible for financing the overall development of Electronics. This administrative reform created disputes for jurisdiction between the Office of Electronics and Computer Industries (DIELI) at the Ministry of Industry and the Ministry

of Post and Telecommunications which did not intend to limit its role to "signing checks." It also led to the break-up of the electronics office, one that the socialists have always insisted that it is necessary to keep intact. Mr Farnoux's report, submitted to the government in April 1982 made a unified command the sine qua non condition required for these industries to bring themselves up to the Americans and the Japanese. Finally, the various "taps" made into PTT revenues for the sake of the general budget are a high risk for the future. It is not possible to "modernize" France and speed up its entry into the era of the information civilization by dipping into the coffers of the PTT--which are a vital force behind this very modernization.

The appointment of Mr Hirel is, on all of these questions, symbolic. The former director of the DIELI still has access to the president's and prime minister's offices, which could restore the political weight that the PTT office has been lacking for 3 years. His former duties at the Ministry of Industry should also facilitate administrative coordination and re-establish an overall consistency in governmental actions in electronics. Mr Hirel, who has always been in favor of unity in the electronics sector, was a member of Mr Farnoux's team, wasn't he? The 1985 budget appropriated to the electronics sector, which has to be higher than last year's (DIELI's budget will increase by 20 percent), should help it. After the vagueness witnessed in the past year, the government seems to want to give its actions in favor of electronics a necessary new "impetus."

12413

CSO: 5500/2761

## STRATEGY FOR ANSWERING MACHINES SALES UNSUCCESSFUL

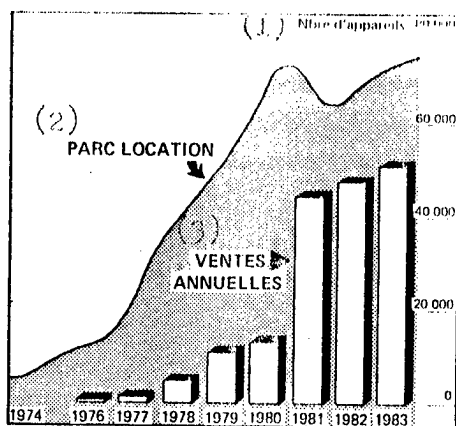
Paris LES ECHOS in French 8 Aug 84 p 6

[Text] In October 1980, when the French PTT [Post and Telecommunications Administration] created a sensation with the announcement made through its commercial affiliate EGT [General Telecommunications Company] of its intention to develop quickly a French industry of telephone answering machines that would counter foreign competition, everyone rubbed their hands: What a good market to go after! Four years later, manufacturers and the commercial network are losing faith.

The goal of marketing 400,000 machines is far from being attained: The exact figure would probably be around 260,000 (180,000 answering machines sold and 80,000 rented).

Consequently, EGT lost 80 million francs last year. As for the manufacturers, some had to drop out, as in the case of Crouzet which stopped producing its answering machines and will probably not be able to remain in the sector for long; others were forced to file for bankruptcy, as in the case of ELEM [Electromechanics Company of Lorraine] which did not succeed in converting to telephone answering machine production.

Figure 1.



Key:

1. Number of machines
2. Rented machines
3. Annual sales

Table 1. Trends in Rates (in French francs)

<u>Type of Machine</u>	<u>Sales Price</u>			<u>Monthly Rental</u>		
	<u>1980</u>	<u>1983</u>	<u>1984</u>	<u>1980</u>	<u>1983</u>	<u>1984</u>
Simple answering machines	1,280	1,090	1,200	65	51	-
Answering/recording machines	3,660	2,089	1,988	125	93	107
Remote message retrieval machines	4,900/ 5,600	3,680/ 3,548	3,680/ 3,548	200	164	173

In the meantime, companies (mostly small- and medium-sized companies) that prospered in 1974 when the PTT became interested in answering machines, such as Zettler, Polydict, Ordinophone, Belcome or Amsofone, were practically forced to withdraw from the market. Only two companies are currently making it: in the lead by far, Radiotechnique (the French affiliate of Philips) which alone fills more than half of EGT's orders, and to a lesser degree, CSEE [Signal Company] which, in spite of temporary halt in production (under American license), is seeking to stay in the sector with the launching of new items, notably the remote message retrieval machine.

Given these conditions, "to say that a French industry has been created makes me laugh...especially since it has been the death of all small- and medium-sized companies," charged one of the manufacturers concerned. Mr Darrigrand, president and director-general of EGT, of course does not see it that way. "We have achieved two-thirds of our goals, which is not all that bad. It is concerning remote message retrieval machines that we were too optimistic." Nonetheless, after having laid off 200 employees at the beginning of 1984, EGT very much hopes--setting aside the costs of restructuring--to try to balance its accounts at the end of the year and to be back in the running as of 1985.

#### Eliminating Rentals

Mr Darrigrand therefore decided several months ago to use a new, more aggressive policy. "In 1981, when we drastically lowered the sales price of answering machines, we minimized its impact on the rental machines. Many contracts, which had become too expensive comparatively, were terminated. We, in turn, then had to reduce the rental rate," he explained. Below a certain minimal level of rental, it becomes impossible to make it worthwhile to rent, as fixed costs then become too great. After-sales service, more and more used because of an increased incidence of breakdown, the billing department, unpaid accounts: these are irreducible costs that, at best, reduce margins and at worst, result in a deficit.

The present strategy therefore aims to eliminate totally rentals of simple answering machines and to limit as much as possible rentals of answering/recording machines or remote message retrieval machines. To spur distribution, while at the same time trying to make a profit, EGT has again reduced by 5 percent the sales price of answering/recording machines

and, conversely, increased the rental rates by 15 percent. A vicious circle, in other words.

The client has difficulty knowing what to make of all this. Except perhaps that he still has as much trouble finding a machine to his liking and tries instead to obtain one through a friend who is returning from the United States.

"EGT's mistake was to handle the answering machine like an every-day product, when it is actually for professional use," specialists indicated. With declared installations numbering 250,000 for 21 million telephone subscribers, they seem to be right. However, it is true that the PTT's initiative at the end of 1980 brought about a tripling of sales. That was not enough, since the starting point was low and the market quickly went into stagnation: No one, except possibly Radiotechnique, is getting anything out of it.

12413

CSO: 5500/2761



# EXPANSION OF TELECOMMUNICATIONS SERVICES PLANNED

Luxembourg LUXEMBURGER WORT in German and French 25 Jul 84 p 11

[Text] The PT [Postal and Telecommunications] administration, in its report for the year 1976, published a study of "postal and telecommunications services viewed in light of territorial development." This study was designed to point out trends and prospects for PT traffic and networks on the 1990 horizon, based on the growth recorded between 1965 and 1975. In its report for 1983, the PT administration prepared a midterm report for this 15-year period, noting that some performances planned for the year 1990 have already been reached or even surpassed today.

The number of letters mailed through the postal system has accelerated its rate of growth. Just for national traffic alone, the number of letters mailed, estimated at 71.1 million for the year 1990, rose from 64.1 million in 1975 to 87.9 million in 1983. International traffic has also shown a considerable increase, rising during the same period from 24.1 million to 31.3 million (outgoing), and from 22.9 to 31.4 million (incoming).

In the area of financial services, the number of CCP [Postal Checking Accounts] has risen from 46,820 to 67,535, already exceeding by more than 5,000 the number predicted for 1990. Trends in the number of transactions are similar: up from 7.2 to 10.2 million (estimate for 1990: 7.7 million).

The rate of growth of telecommunications traffic is declining: this is apparently due in large part to the consequences of the inevitable phenomenon of gradual saturation. National telephone traffic has risen from 87.7 to 142.6 million pulses (estimate for 1990: 163.4 million). International traffic (originating), however, has already surpassed the threshold of 63.3 million pulses set for 1990, reaching 68.2 million in 1983, up from 30.7 million in 1975.

Telegraphic traffic is down: while there were 231,000 telegrams sent in 1975, in 1983 there were only 66,000. National telex traffic, though, has already greatly exceeded the level of 0.95 million minutes estimated for 1990, reaching 2.02 million minutes in 1983, compared with 0.53 million in 1975. The number of telex subscribers has more than doubled, rising from 989 to 2,089; the number of telephone subscribers is up from 106,545 to 142,134.

According to the study's authors, these results were only made possible through a rise in productivity and the use of considerably expanded resources in terms of personnel, investments, and organization. The authors pointed out that in the field of PT, there are never any true final solutions.

But at the dawn of the age of glass fibers and communications satellites heralding the coming of the era of total information, some major problems left over from the 1960s--obtaining a sufficiently smooth flow of national and international telephone traffic, the large number of delays in requests for connections to the telephone system, and mail distribution--have finally been resolved satisfactorily. The considerable increase in postal and telephone traffic that will probably continue for a long time may, however, cause bottlenecks to appear at any time in either area of the PT service.

The challenges which the PT administration will have to face and the goals which this agency has set for itself are many. As an example, we can cite the following for postal services:

- a. The establishment of ultrarapid distribution for international service to meet specific needs, especially for the financial and European markets.
- b. The expansion of mail service to include packages by improving its competitive position, if necessary in synergy with the CFL [expansion unknown] company.
- c. The diversification of financial services, through the introduction of postal savings and additional stimuli for the CCP service by introducing customary banking facilities, in order to make better use of available counters.
- d. The authorization of postal counter service.
- e. The automation of sorting in order to maximize the usefulness of the four-digit postal area code.

- f. The adjustment of rates to reflect the costs of different postal services, to the extent politically possible.

For telecommunications, the following are some of the goals that have been set:

- a. The widespread use of computers and digital systems in transmission and switching.
- b. An improvement in the quality of services provided by modernizing equipment, by the generalized use of automatic equipment to monitor the proper operation of services, and by the adaptation of maintenance resources to meet the needs of the network and its customers.
- c. The design and execution of a policy of community radio and television antennas, and the adaptation of these systems to receive programs transmitted via satellite.
- d. The automation of the management of administrative services for telephone subscribers.
- e. Automation of management of telecommunications networks.
- f. The mastery, extension, and improvement of new data transmission networks (Luxpac) and alarm systems.
- g. The introduction of new telecommunications services, such as teletex, videoconferences, videotext, and later visiophone services.
- h. The establishment, in cooperation with European institutions, international PT organizations, and foreign PT agencies, of joint financing arrangements to cover new PT investments, whose developments will be used by all parties.

#### Need for Greater Financial Autonomy

In order to be able to carry out these projects, the administration which oversees the monopolies and services in this area should have greater autonomy, particularly for financial and personnel matters.

Since 1978, handling problems just in the area of telecommunications and solely in terms of investments has required financing of about 700 to 900 million francs a year, and future investment needs are growing. As it is by no means certain that the situation of the state will permit it to maintain on a permanent basis such a high level of financing for the PT in the future, it now seems appropriate to establish the Telecommunications Investment Fund, created by the budget for the 1973 fiscal year, as a legal entity distinct from the state, and to extend its scope to include all PT investments. The fund would be supported by budget allocations, by loans, or by credit, with surpluses of current PT revenue over current costs to be used to amortize interests and costs.

Greater autonomy in terms of personnel could be achieved by a 5-year program to meet the needs for increased personnel required to resolve some major problems.

7679

CSO: 5500/2754

STUDY GROUP PROPOSES SPLITTING TELECOMMUNICATIONS AGENCY

Oslo AFTENPOSTEN in Norwegian 29 Aug 84 p 40

[Article by Ulf Peter Hellstrøm: "Committee Wants to Split Telecommunications Agency"]

[Text] The Telecommunications Agency is to be split up into one section for monopoly services, one section for competitive business, and one for approval of types and cable network supervision. This comes from the Stette Committee's recommendation regarding organization of future telecommunications operations in Norway.

The recommendation is characterized by a couple of central disagreements in which the committee has split into various factions. There is disagreement regarding to what extent the monopoly services are to be organized in a corporation or regarding whether the administration model is to continue to be maintained.

The 11-member committee under the chairmanship of Professor Gunnar Stette has divided telecommunications operations into three main areas: administrative tasks with the approval of types and supervision of the cable network; a competitive business which extends beyond the State monopoly; and a base organization for the service's monopoly services.

The committee unanimously advocates that the competitive business--which is represented today first and foremost by the Telecommunications Agency Business Communications (TBK) project--be separated as a private corporation. This will provide the greatest flexibility and freedom of action in competition with private concerns.

However, the committee is split on the question as to whether the remaining part of the Telecommunications Agency or the Ministry of Transport and Communications ought to be the owner of this competitive business. A majority of seven members recommends that the ministry come in as owner. Among the majority's members are, among others, Savings Bank Association Administrative Director Beret Klemetsen and Professor Preben Munthe. The minority, which numbers, among others, Professor Stette, representatives of the Telecommunications Agency's administration and employees, as well as Norsk Data Administrative

Director Rolf Skår, advocates that the competitive business be placed under the monopoly services as a private, wholly owned subsidiary company.

The majority, in its recommendation, claims that separating the competitive business under the Ministry of Transport and Communications would be the best way to prevent hidden subsidizing from the base organization. The majority points out also the awkward situation that the base organization will be in a double role as owner and important contract partner if the competitive business is included as part of a larger Telecommunications Agency concern. The minority places major emphasis on choosing the form of association which will best ensure for users over the entire country equipment and services at the lowest possible price.

The minority advocates that the competitive business be organized as a wholly owned holding company under the Telecommunications Agency's base organization, and with operating companies under this. This would imply an opening for later subsidiary companies.

A scant majority of 6 out of 11 members believes that organization of the monopoly services, or the base organization, ought to be as a private corporation after the Statoil model. During the press conference it was pointed out that this would provide the most efficient operation and highest productivity and that this form of organization would thereby provide greater room for lower telecommunications service rates. A corporation will be able to invest by borrowing in the credit market, while the wage policy will be freed so that the demand for key personnel can be covered.

The minority does not want to detach the base organization so strongly from the State system as the corporation form would imply. The monopoly gives the exclusive right to shape important aspects of the community's infrastructure, the minority points out, which believes that the changeover to a State corporation can be evaluated later when experience has been gained in the alteration of administrative operations.

The Stette Committee has concentrated on the organization of telecommunications operations for Norway and emphasizes that the committee has not taken a position on to what extent State telecommunications operations are to be carried out in competition with private.

The committee unanimously advocates that a new arrangement be introduced for the most important of the Telecommunications Agency's administrative duties, like supervision of the cable network, approval of types of user equipment, and activities which concern rights in the radio area. This is to be carried out by a separate agency outside the Telecommunications Agency which is to be placed under the Ministry of Transport and Communications. A majority of the committee believes that this agency should have its own board of directors, while a minority sees no reason for this.

#### Disagreement Regarding Telecommunications Recommendation

Telecommunications Agency General Director Kjell Holler disagreed with the proposal that competitive telecommunications service operations should be

separated from the remaining monopoly part when the Stette Committee's recommendation was presented during a press conference in Oslo on Tuesday. Transport and Communications Minister Johan J. Jacobsen also expressed surprise at this proposal.

The cabinet minister reiterated to AFTENPOSTEN that the ministry still intends to present by the turn of the year its Storting report regarding telecommunications operations, so that the Storting can discuss the matter in the spring session. Representatives of employees' organizations in the Telecommunications Agency are coming out with, in part, harsh criticism of several proposals in the report.

"This will create an insecure job situation for employees in the service," LO- [Norwegian Federation of Trade Unions] affiliated Norwegian Telecommunications Service Federation Deputy Chairman Tore Lundberg says.

"The proposals from the Stette Committee regarding separation of the competitive business from the monopoly services seems logical and right to me. However, I react to the fact that a minority is advocating that the competitive business should continue to be owned by the monopoly. This can create confusion for those private concerns which enter into competition with the State-owned competitive business," Office and Computer Technology Workers National Union branch union Chairman Gunnar Garø says in a direct commentary.

#### "Leading Nation"

Transport and Communications Minister Jacobsen emphasized during the press conference that Norway has ambitions of becoming a leading nation in telecommunications. A precondition for this is that as rapid as possible clarification of the regulations for the telecommunications business be gotten, the cabinet minister said, who promised quick handling of the matter in the ministry. The Stette Committee's recommendation will aim at at a 6-week-long round of hearings.

"This was essential for working with the base organization to find a balance between the regard for political control and freedom of action in terms of business economics," Professor Stette pointed out at the press conference.

General Director Holler's personal reaction after a quick perusal of the recommendation was, among other things, disagreement with a majority of the committee which wants to separate the competitive business from the monopoly organization. "I know no other country in Europe which has tried in this way to exclude the Telecommunications Agency from the entire terminal market and this type of user service," Holler said. The general director intimated, in addition, that separation of the competitive business from the rest of the Telecommunications Agency's business will be able to affect about 5 percent of the service's 20,000 jobs.

"We are afraid that the corporation form as far as the dominating part of the monopoly is concerned will open the door to denationalization of the telecommunications business in the next round," Telecommunications Service Federation Deputy Chairman Lundberg says.